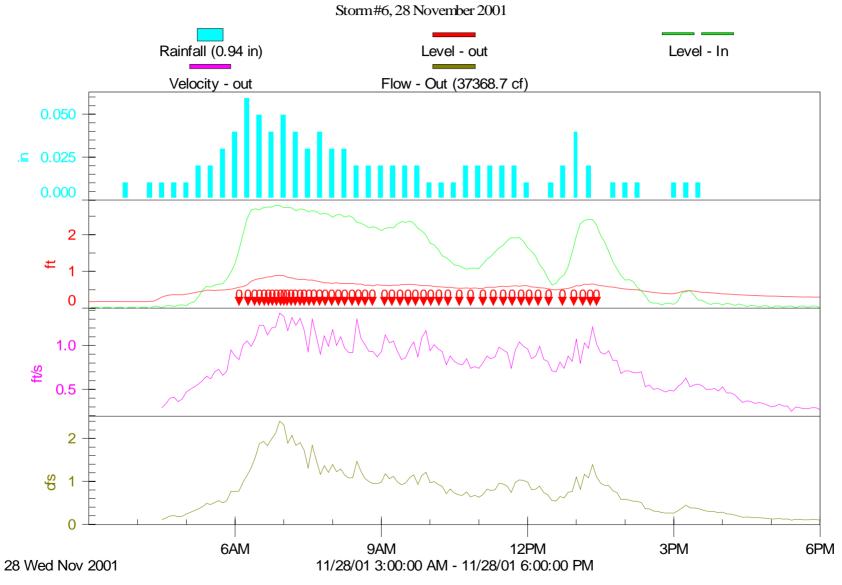
STORM EVENT NUMBER 6

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SR 405 Vortechnics



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•		



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PROJECT NARRATIVE for B1K0556

Client: Taylor Associates

Project Manager: James Packman Project Name: SR405 Vortechs Project Number: Not Provided

1.0 DESCRIPTION OF CASE

Two water sample were received for the analysis of:

- Total Zinc by EPA 200.8
- Dissolved Zinc by EPA 200.8
- Hardness by SM2340B
- Orthophosphate by EPA 365.2
- Total Phosphorous by EPA 365.2
- Total Suspended Solids by EPA 160.2
- Turbidity
- pH by EPA 150.1

2.0 COMMENTS ON SAMPLE RECEIPT

The samples were received and logged in on 29th November 2001 at a temperature of 0.9 Degrees C.

Preparation and Analysis

There were no anomalies associated with the preparation and analysis with all QA being within method established criteria. However the following analyses do need to be commented on

Dissolved Zinc

The dissolved metals were filtered and preserved with Nitric Acid in house prior to analysis.

"I certify that this data package is in compliance with the Contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature."

Project Manager

North Creek Analytical



Taylor Associates

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Portfand

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

3917 Ashworth Ave North Project Number: Not Provided Seattle WA/USA, 98103 Project Manager: James Packman Reported:

12/11/01 10:37

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
VOR-112801-IN	B1K0556-01	Water	11/28/01 13:24	11/29/01 07:02
VOR-112801-OUT	B1K0556-02	Water	11/28/01 13:25	11/29/01 07:02

Project: SR405 Vortechs

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Taylor Associates 3917 Ashworth Ave North Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 12/11/01 10:37

Total Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
·OR-112801-IN (B1K0556-01) Water	Sampled: 11	/28/01 13:24	Receive	d: 11/29/01	67:02				
Zinc	0.0153	0.0100	mg/l	1	1L04009	12/04/01	12/05/01	EPA 200.8	
OR-112801-OUT (B1K0556-02) Water	er Sampled:	11/28/01 13:	25 Recei	ved: 11/29/	01 07:02				
Zinc	0.0425	0.0100	mg/l	1	1L04009	12/04/01	12/05/01	EPA 200.8	

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Taylor Associates

3917 Ashworth Ave North Seattle WA/USA, 98103

Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported:

12/11/01 10:37

Dissolved Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VOR-112801-IN (B1K0556-01) Water	Sampled: 11	1/28/01 13:24	Receive	d: 11/29/01	07:02				
Zinc	0.0117	0.0100	mg/l	1	1L06009	12/06/01	12/06/01	EPA 200.8	
VOR-112801-OUT (B1K0556-02) Wate	r Sampled:	11/28/01 13:2	25 Recei	ved: 11/29/	01 07:02				
Zinc	0.0383	0.0100	mg/l	1	1L06009	12/06/01	12/06/01	EPA 200.8	

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Taylor Associates 3917 Ashworth Ave North Seattle WA/USA, 98103

Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 12/11/01 10:37

Conventional Chemistry Parameters by APHA/EPA Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VOR-112801-IN (B1K0556-01) Water	Sampled: 11	1/28/01 13:24	Received:	11/29/01	07:02				
Hardness	17.0	1.00 mg	eq. CaCO3/L	. 1	1L04009	12/04/01	12/08/01	SM 2340B	
rthophosphate-phosphorus	0.0120	0.00200	mg/t		1L05004	11/29/01	11/29/01	EPA 365.2	
. hosphorus	0.0404	0.00500	H		1L03029	12/03/01	12/03/01		
рН	6.92		pH Units	•	IL01005	11/29/01	11/29/01	EPA 150.1	
'otal Suspended Solids	30	4.0	mg/l	"	1L11001	12/04/01	12/10/01	EPA 160.2	
urbidity	23.7	1.00	NTU	n	1L03016	11/30/01	11/30/01	EPA 180.1	
VOR-112801-OUT (B1K0556-02) Water	Sampled:	11/28/01 13:	25 Receive	d: 11/29/	01 07:02				
lardness	16.7	1.00 mg	eq. CaCO3/L	. 1	1L04009	12/04/01	12/08/01	SM 2340B	
orthophosphate-phosphorus	0.0110	0.00200	mg/l		IL05004	11/29/01	11/29/01	EPA 365.2	
Phosphorus	0.0450	0.00500	lt	"	1L03029	12/03/01	12/03/01	π	
·H	7.00		pH Units	π	1L01005	11/29/01	11/29/01	EPA 150.1	
otal Suspended Solids	24	4.0	mg/l	Ħ	1L11001	12/04/01	12/10/01	EPA 160.2	
Turbidity	17.4	1.00	NTU	Ħ	1L03016	11/30/01	11/30/01	EPA 180.1	

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Taylor Associates

Project: SR405 Vortechs

3917 Ashworth Ave North Seattle WA/USA, 98103

Project Number: Not Provided Project Manager: James Packman Reported:

12/11/01 10:37

Total Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1L04009:	Prepared 12/04/01	Using El	PA 200 Ser	ies					·		
Blank (1L04009-BI	LK1)										
Zinc	V-1A-	ND	0.0100	mg/l			•	-,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
LCS (1L040 0 9-BS1)										
Zinc		0.208	0.0100	mg/l	0.200		104	85-115			•
LCS Dup (1L04009	P-BSD1)										
Zinc		0.209	0.0100	mg/l	0.200		104	85-115	0.480	15	
Duplicate (1L04009	P-DUP1)					Source: E	31K0488-	01			
Zinc		ND	0.0100	mg/l	· · · · · · ·	ND		· - ·	3.99	20	
Matrix Spike (1L04	1009-MS1)					Source: E	31K0488-	01			
Zinc		0.212	0.0100	mg/l	0.200	ND	101	75-125			
rix Spike (1L04	1009-MS2)					Source: E	31K0580-	01			
Zinc		0.203	0.0100	mg/l	0.200	ND	100	75-125			

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Taylor Associates 3917 Ashworth Ave North Seattle WA/USA, 98103

Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 12/11/01 10:37

Dissolved Metals by EPA 200 Series Methods - Quality Control

North Creek Analytical - Bothell

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1L06009: Prepared 12/06/0	1 Using E	PA 3005A							· · · · · ·	
Blank (1L06009-BLK1)					•				. <u></u>	
inc	ND	0.0100	mg/l				<u></u>			
LCS (1L06009-BS1)										
Tine	0.194	0.0100	mg/l	0.200		97.0	85-115			
.CS Dup (1L06009-BSD1)										
Zine	0.193	0.0100	mg/l	0.200		96.5	85-115	0.517	15	
fatrix Spike (1L06009-MS1)					Source: E	31K0572-	01			
zine	0.199	0.0100	mg/l	0.200	ND	99.5	75-125			
fatrix Spike Dup (1L06009-MSD1)				i	Source: E	31K0572-	01			
inc	0.200	0.0100	mg/l	0.200	ND	100	75-125	0.501	20	

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Taylor Associates

3917 Ashworth Ave North Seattle WA/USA, 98103

Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 12/11/01 10:37

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1L01005:	Prepared 11/29/01	Using G	eneral Pre	paration							
Duplicate (1L01005	5-DUP1)					Source: I	31K0556-	01		•	
рН		7.03		pH Units		6.92			1.58	10	
Batch 1L03016:	Prepared 11/30/01	Using G	eneral Pre	paration							
Blank (1L03016-Bl	LK1)										
Turbidity		ND	1.00	NTU							
LCS (1L03016-BS1)										
Turbidity		19.3	1.00	NTU	20.0		96.5	90-110			
LCS Dup (1L03016	-BSD1)										
Turbidity	-	19.3	00.1	NTU	20.0		96.5	90-110	0.00	20	
Duplicate (1L03016	5-DUP1)					Source: E	B1K0556-	01			
vidity		23.2	1.00	NTU		23.7			2.13	20	
Batch 1L03029:	Prepared 12/03/01	Using G	eneral Pre	paration							
Blank (1L03029-B)	LKI)										
Phosphorus		ND	0.00500	mg/l		— - -					
LCS (1L03029-BS1)										
Phosphorus		0.144	0.00500	mg/l	0.150		96.0	90-120			
LCS Dup (1L03029	-BSD1)										
Phosphorus		0.144	0.00500	mg/l	0.150		96.0	90-120	0.00	20	

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Taylor Associates 3917 Ashworth Ave North Project: SR405 Vortechs

Seattle WA/USA, 98103

Project Number: Not Provided Project Manager: James Packman

Reported: 12/11/01 10:37

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

· · · · · · · · · · · · · · · · · · ·		• •	Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Jatch 1L03029:	Prepared 12/03/01	Using G	eneral Pre	paration							
Matrix Spike (1L0)	3029-MS1)					Source: E	1K0522-	03			
hosphorus		0.130	0.00500	mg/l	0.121	0.0119	97.6	60-139			
Matrix Spike Dup	(1L03029-MSD1)		Source: B1K0522-03								
hosphorus		0.130	0.00500	mg/l	0.121	0.0119	97.6	60-139	0.00	25	
Batch 1L04009:	Prepared 12/04/01	Using E	PA 200 Ser	ies							
"lank (1L04009-B)	LK1)										
Iardness		ND	1.00mg	g eq. CaCO3/L							
LCS (1L04009-BS)	1)										
lardness		33.6	1.00 mg	g eq. CaCO3/L	33.1		102	70-130			
LCS Dup (1L04009	9-BSD1)										
Iness		33.5	1.00mg	g eq. CaCO3/L	33.1		101	70-130	0.298	20	
Suplicate (1L04009	9-DUP1)					Source: B	1K0488-	01			
Hardness		70.7	1.00mg	g eq. CaCO3/L		75.0			5.90	20	
4atrix Spike (1L04	4009-MS1)					Source: B	1K0488-	01			
lardness	······································	101	1.00mg	g eq. CaCO3/L	33.1	75.0	78.5	75-125			
Batch 1L05004;	Prepared 11/29/01	Using G	eneral Prej	paration							
llank (1L05004-Bl	L K 1)										
Orthophosphate-phosp	horus	ND	0.00200	mg/l							·

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Taylor Associates

3917 Ashworth Ave North Seattle WA/USA, 98103

Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported:

12/11/01 10:37

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1L05004: Prepared 11/29/01	Using G	eneral Pre	paration							
LCS (1L05004-BS1)						_		""		
Orthophosphate-phosphorus	0.150	0.00200	mg/l	0.150		100	90-110			
LCS Dup (1L05004-BSD1)										
Orthophosphate-phosphorus	0.155	0.00200	mg/l	0.150		103	90-110	3.28	20	
Matrix Spike (1L05004-MS1)					Source: E	1K0556-	01			
Orthophosphate-phosphorus	0.0620	0.00200	mg/l	0.0499	0.0120	100	80-120			
Matrix Spike Dup (1L05004-MSD1)					Source: E	31K0556-	01			
Orthophosphate-phosphorus	0.0659	0.00200	mg/l	0.0499	0.0120	108	80-120	6.10	25	
Batch 1L11001: Prepared 12/04/01	Using G	eneral Pre	paration							
Blank (1L11001-BLK1)			· · · ·							
1 Suspended Solids	ND	4.0	mg/l							
Duplicate (1L11001-DUP1)					Source: E	1K0556-	01			
Total Suspended Solids	30	4.0	mg/l		30			0.0	19	

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Taylor Associates 3917 Ashworth Ave North Seattle WA/USA, 98103

Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported:

12/11/01 10:37

Notes and Definitions

DET

Analyte DETECTED

ND

Analyte NOT DETECTED at or above the reporting limit

NR

dry

Sample results reported on a dry weight basis

RPD

Relative Percent Difference

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Environmental Laboratory Network Page 10 of 10

7

Particle Size Distribution Analysis Results: Storm 6 Inlet

Report Prepared for: Ingrid Weltz **Taylor Associates** Tel: 206.633.4486

Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact Dr. David Stensel Tel: 206.543.9358

Project ID:

SR405 Vortechnics

Sample ID:

VOR-112801-IN

Date and Time Collected:

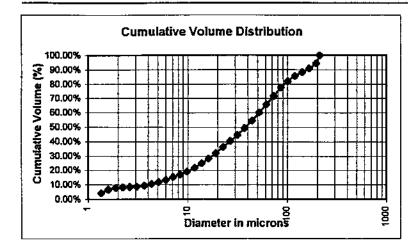
11/28/01

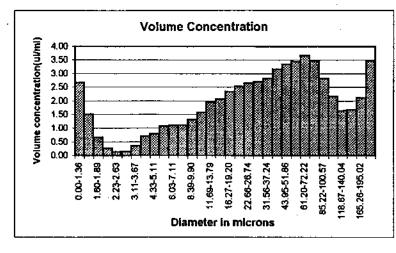
0.558333333

Date and Time of PSD Analysis:

11/30/01

0.50555556





Size		Cumulative	Harry Name
Range	Concentration	VOLETIE	
(microns)	(471)	(8.	(0.0)
0.00-1,36	2.65	4.32%	1.12
1.36-1.60	1.51	6.78%	0.63
1.60-1.89	0.68	7.88%	0.28
1.89-2.23	0.26	8.31%	0.11
2.23-2.63	0.12	8.51%	0.05
2.63-3.11	0.14	8.73%	0.06
3.11-3.67	0.35	9.31%	0.15
3.67-4.33	0.71	10.47%	0.30
4.33-5.11	0.79	11.75%	0.33
5.11-6.03	1.07	13.50%	0.45
6.03-7.11	1.10	15.29%	0.46
7.11-8.39	1.11	17.10%	0.47
8.39-9.90	1.31	19.23%	0.55
9.90-11.69	1.58	21.81%	0.66
11.69-13.79	1.95	24.98%	0.82
13,79-16,27	2.07	28.35%	0.87
16.27-19.20	2.34	32.16%	0.98
19.20-22.66	2.53	36.28%	1.06
22.66-26.74	2.64	40.58%	1.11
26.74-31.56	2.69	44.96%	1.13
31.56-37.24	2.82	49.55%	1.19
37.24-43.95	3.16	54.70%	1.33
43.95-51.86	3.35	60.16%	1.41
51.86-61.20	3.45	65.77%	1.45
61.20-72.22	3.66	71.74%	1.54
72.22-85.22	3.47	77.40%	1.46
85.22-100.57	2.82	81.99%	1.19
100.57-118.67	2.16	85.50%	0.91
118.67-140.04	1.65	88.18%	0.69
140.04-165.26	1.67	90.91%	0.70
165.26-195.02	2.11	94.35%	0.89
195.02-212	3.47	100.00%	1.46
Total	61.39		25.80

Computed Statistics:

Weight Mean = 62.49 microns

3.67 microns $D_{10} =$ $D_{50} = 37.24$ microns $D_{90} = 140.04 \text{ microns}$

Volume of Sample:

950 ml

Volume of Dilution:

0 ml added

Comments: 1/0/00

Size Range	Mass of TSS	% Mass
(Ifficions)	(mg)	TES
< 212	25.80	89.90%
212-425	1.70	5.92%
425-850	0.40	1.39%
>850	0.80	2.79%
Total	28.70	100.00%

Particle Size Distribution Analysis Results: Storm 6 Outlet

Report Prepared for: Ingrid Weltz **Taylor Associates** Tel: 206.633.4486

Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact Dr. David Stensel Tel: 206.543.9358

STILL VALUE OF THE STATE OF THE

Project ID:

SR405 Vortechnics

Sample ID:

VOR-112801-OUT

Date and Time Collected:

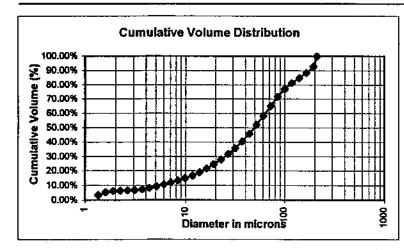
11/28/01

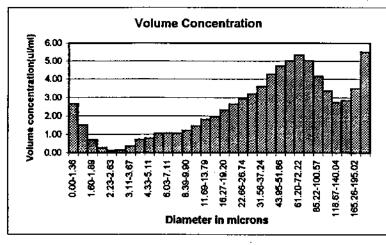
0.559027778

Date and Time of PSD Analysis:

11/30/01

0.5375





Range Concentration Column Colu	0948	***************************************	CHITCHENIA	1005
0.00-1.36 2.65 3.41% 0.99 1.36-1.60 1.51 5.35% 0.56 1.60-1.89 0.68 6.23% 0.25 1.89-2.23 0.26 6.57% 0.10 2.23-2.63 0.13 6.73% 0.05 2.63-3.11 0.14 6.91% 0.05 3.11-3.67 0.36 7.37% 0.13 3.67-4.33 0.71 8.28% 0.26 4.33-5.11 0.78 9.29% 0.29 5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98		PARTY TO THE PARTY		
1.36-1.60 1.51 5.35% 0.58 1.60-1.89 0.68 6.23% 0.25 1.89-2.23 0.26 6.57% 0.10 2.23-2.63 0.13 6.73% 0.05 2.63-3.11 0.14 6.91% 0.05 3.11-3.67 0.36 7.37% 0.13 3.67-4.33 0.71 8.28% 0.26 4.33-5.11 0.78 9.29% 0.29 5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09	***************************************			(Pig)
1.60-1.89 0.68 6.23% 0.25 1.89-2.23 0.26 6.57% 0.10 2.23-2.63 0.13 6.73% 0.05 2.63-3.11 0.14 6.91% 0.05 3.11-3.67 0.36 7.37% 0.13 3.67-4.33 0.71 8.28% 0.26 4.33-5.11 0.78 9.29% 0.29 5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 </td <td></td> <td></td> <td>3.41%</td> <td>0.99</td>			3.41%	0.99
1.89-2.23 0.26 6.57% 0.10 2.23-2.63 0.13 6.73% 0.05 2.63-3.11 0.14 6.91% 0.05 3.11-3.67 0.36 7.37% 0.13 3.67-4.33 0.71 8.28% 0.26 4.33-5.11 0.78 9.29% 0.29 5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.3			5.35%	0.56
2.23-2.63 0.13 6.73% 0.05 2.63-3.11 0.14 6.91% 0.05 3.11-3.67 0.36 7.37% 0.13 3.67-4.33 0.71 8.28% 0.26 4.33-5.11 0.78 9.29% 0.29 5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86%		0.68	6.23%	0.25
2.63-3.11 0.14 6.91% 0.05 3.11-3.67 0.36 7.37% 0.13 3.67-4.33 0.71 8.28% 0.26 4.33-5.11 0.78 9.29% 0.29 5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% <	1.89-2.23	0.26	6.57%	0.10
3.11-3.67 0.36 7.37% 0.13 3.67-4.33 0.71 8.28% 0.26 4.33-5.11 0.78 9.29% 0.29 5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35%	2.23-2.63	0.13	6.73%	0.05
3.67-4.33 0.71 8.28% 0.26 4.33-5.11 0.78 9.29% 0.29 5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21%	2.63-3.11	0.14	T 7	0.05
4.33-5.11 0.78 9.29% 0.29 5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66%	3.11-3.67	0.36	7.37%	0.13
5.11-6.03 1.05 10.63% 0.39 6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% </td <td>3.67-4.33</td> <td>0.71</td> <td>8.28%</td> <td>0.26</td>	3.67-4.33	0.71	8.28%	0.26
6.03-7.11 1.05 11.99% 0.39 7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.3	4.33-5.11	0.78	9.29%	0.29
7.11-8.39 1.04 13.32% 0.39 8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72	5.11-6.03	1.05	10.63%	0.39
8.39-9.90 1.20 14.87% 0.45 9.90-11.69 1.45 16.73% 0.54 11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.05 165.26-195.02 3.49 92.93%	6.03-7.11	1.05	11.99%	0.39
9,90-11,69 1,45 16,73% 0,54 11,69-13,79 1,80 19,04% 0,67 13,79-16,27 1,97 21,57% 0,73 16,27-19,20 2,32 24,55% 0,86 19,20-22,66 2,63 27,93% 0,98 22,66-26,74 2,92 31,69% 1,09 26,74-31,56 3,19 35,78% 1,18 31,56-37,24 3,59 40,40% 1,33 37,24-43,95 4,25 45,86% 1,58 43,95-51,86 4,72 51,92% 1,75 51,86-61,20 5,00 58,35% 1,86 61,20-72,22 5,33 65,21% 1,98 72,22-85,22 5,02 71,66% 1,87 85,22-100,57 4,14 76,99% 1,54 100,57-118,67 3,36 81,30% 1,25 118,67-140,04 2,72 84,80% 1,01 140,04-165,26 2,84 88,45% 1,05 165,26-195,02 3,49	7.11-8.39	1.04	13.32%	0.39
11.69-13.79 1.80 19.04% 0.67 13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.05 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50	8.39-9.90	1.20	14.87%	0.45
13.79-16.27 1.97 21.57% 0.73 16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	9.90-11.69	1.45	16.73%	0.54
16.27-19.20 2.32 24.55% 0.86 19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	11.69-13.79	1.80	19.04%	0.67
19.20-22.66 2.63 27.93% 0.98 22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	13.79-16.27	1.97	21.57%	0.73
22.66-26.74 2.92 31.69% 1.09 26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	16.27-19.20	2.32	24.55%	0.86
26.74-31.56 3.19 35.78% 1.18 31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.05 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	19.20-22.66	2.63	27.93%	0.98
31.56-37.24 3.59 40.40% 1.33 37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.05 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	22.66-26.74	2.92	31.69%	1.09
37.24-43.95 4.25 45.86% 1.58 43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.05 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	26.74-31.56	3.19	35.78%	1,18
43.95-51.86 4.72 51.92% 1.75 51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	31.56-37.24	3.59	40.40%	1.33
51.86-61.20 5.00 58.35% 1.86 61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	37.24-43.95	4.25	45.86%	1.58
61.20-72.22 5.33 65.21% 1.98 72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	43.95-51.86	4.72	51.92%	1.75
72.22-85.22 5.02 71.66% 1.87 85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	51.86-61.20	5.00	58.35%	1.86
85.22-100.57 4.14 76.99% 1.54 100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.05 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	61.20-72.22	5.33	65.21%	1.98
100.57-118.67 3.36 81.30% 1.25 118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	72.22-85.22	5.02	71.66%	1.87
118.67-140.04 2.72 84.80% 1.01 140.04-165.26 2.84 88.45% 1.06 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	85.22-100.57	4.14	76,99%	1.54
140.04-165.26 2.84 88.45% 1.05 165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	100.57-118.67	3.36	81.30%	1.25
165.26-195.02 3.49 92.93% 1.30 195.02-212 5.50 100.00% 2.04	118.67-140.04	2.72	84.80%	1.01
195.02-212 5.50 100.00% 2.04	140.04-165.26	2.84	88.45%	1.05
195.02-212 5.50 100.00% 2.04	165.26-195.02		92.93%	
Total 77.77 28.90		5.50	100.00%	2.04
	Total	77.77		28.90

Computed Statistics:

Weight Mean = 73.31 microns

 $D_{10} =$ 5.11 microns 43.95 microns $D_{90} = 165.26 \text{ microns}$

Volume of Sample:

900 ml

Volume of Dilution:

0 ml added

Comments: 1/0/00

Size Range (microne)	Mass of Tus Imp	% Miles
< 212	28.90	93.23%
212-425	0.80	2.58%
425-850	0.60	1,94%
>850	0.70	2.26%
Total	31.00	100.00%

	SITE VISIT	SHEET (SR 405 V	Vortechs TM Monitoring)	
Date/Time	1 1/26/01	Field Staff 1/	Weather cloudy of cool	_
	Pre-Str	rom Visit) or - Post-Storm	ı Visit (circle one)	
	INLET		<u>outlet</u>	
Check Curre	ent Readings / Downloa	d: 11/26	Check Current Readings / Download	: 11/26
ISCO	Time? reset (Y/N)?	13:19 'N	ISCO Time? reset (Y/N)?	13:15 N
	Time downloaded		Level (ft.)	0. (78 ++
	level _	0.043	Velocity (f/s)	0.13 *
	(2,0)	16.026	Flow (cfs)	Ø ⊁
	(land	1 8.076 k in forth)	Total Flow (cf)	108391.8
	(90%)	C N AA. IV)	Sig/Spec str.	9 (9
		Th. Ct. 17	Time downloaded	
	<u>inlet</u>	Pre - Storm V		
Battery (V)	INLE I	12.4	OUTLET Battery (V)	12.0
Clean bottle (Y/N)?	-\frac{1}{}	Clean bottle (Y/N)?	<u> 12.0</u>
	ok (Y/N)? Replaced?	V	Pump tubing ok (Y/N)? Replaced?	- \
Sampler tubir		- \ -	Sampler tubing ok (Y/N)?	
Strainer ok?	-6 (-7-1)		Strainer ok?	
	t ok (Y/N)? Changed?	~\\\ \	Ext. desiccant ok (Y/N)? Changed?	- 7
	ok (Y/N)? Changed?		Int. desiccant ok (Y/N)? Changed?	
Measure Dn I			Measure Dn level? Ok?	
Sample Volum	me (mi)		Enable level (ft)	> 0.55
Inspect Rain		<u> </u>	Pacing (cf) / Sample Volume (ml)	600 cf/20001
Sampler enab	iled? (Y/N)	Yat 14:17	Sampler, enabled? (Y/N)	
		Post - Storm V	Delay to start Tues 12:00 12/2:	}
	INLET	 	OUTLET	
Equipment Ra	an Completely?		Equipment Ran Completely?	
-	oled (date/time)?		Sampler Enabled (date/time)?	
-	gan (date/time)?		Composite Began (date/time)?	
	bsamples taken?		Number of subsamples taken?	
•	le collection errors?		Any subsample collection errors?	
Last Sample (•		Last Sample (date/time)?	-
Est. Sample \ Sample ID?	/olume Collected (ml)		Est Sample Volume Collected (ml)	
Sample ID?		\	Sample ID?	
Y/N	Value	Storm	Validation Criteria	7
	hrs. (if known)	Was there an antecedent dr	y period of at least six hours?	1
	in.			1
	hrs.	Was runoff duration greate	r than one hour?]
				-
Y/N	Value		posite Sample Validation Criteria	4.
	% (approx.)	was greater than 75% of the	ne total volume of the storm sampled?	4
		Were at least 10 sub-sampl		
	# subsample	were at least 10 sub-sampl	es collected at the outlet?	J
Was a field du	uplicate collected? If so,	Sample ID.	Field blank collected? If so, Sample ID	•

NOTES (including any problems with equipment or maintenance activities performed):

•						
			. TM			
			Vortechs TM Monitoring)			
Date/Time	11/28/01 19:30	Field Staff 🔣 🔭	Weather Neining			
	Pre-Str	om Visit - or Post-Stor	rm Visit (circle one)			
	INLET		OUTLET			
Check Curre	nt Readings / Download Time? reset (Y/N)?	d: . ₃ .	Check Current Readings / Download:	_		
ISCO	Time? reset (Y/N)?		ISCO Time? reset (Y/N)?	19:30 N		
	Time downloaded	71:50	Level (ft.)	0.332		
	10.01	B. 016	Velocity (f/s)	0.34		
	level -		Flow (cfs)	0.145		
			Total Flow (cf)	3 7 234. 7		
			Sig/Spec str.	270/7676		
			Time downloaded	3764		
		Pre - Storm	<u>Visit</u>	19:45		
	<u>INLET</u>		OUTLET			
Battery (V)			Battery (V)			
Clean bottle (Y/N)?		Clean bottle (Y/N)?	<u></u>		
Pump tubing (ok (Y/N)? Replaced?	<u> </u>	Pump tubing ok (Y/N)? Replaced?			
Sampler tubin	g ok (Y/N)?	\	Sampler tubing ok (Y/N)?			
Strainer ok?			Strainer ok?			
Ext. desiccant	ok (Y/N)? Changed?		Ext. desiccant ok (Y/N)? Changed?			
Int. desiccant	ok (Y/N)? Changed?		Int. desiceant ok (Y/N)? Changed?			
Measure Dn l	evel? Ok?		Measure Dn level? Ok?			
Sample Volum	ne (ml)		Enable level (ft)			
Inspect Rain (Gage		Pacing (cf) / Sample Valume (ml)			
Sampler enab	led? (Y/N)		Sampler enabled? (Y/N)			
		Post Store	172-24			
	INLET	Post - Storn	OUTLET			
Equipment Ro	an Completely?	V	Equipment Ran Completely?	Y		
• •	oled (date/time)?	6:03 11/18	Sampler Enabled (date/time)?	7.05 11/27		
_	gan (date/time)?	11	Composite Began (date/time)?	10203 1400		
	bsamples taken?	30	Number of subsamples taken?			
	le collection errors?		Any subsample collection errors?	30		
Last Sample (13:24 1428	Last Sample (date/time)?			
- '	Volume Collected (ml)	15:20 74C8	Est. Sample Volume Collected (ml)	42:25 1428 10L		
Sample ID?	` '	VOR-112801- IN	Sample ID?	YOR-112801-04		
Y/N	Value	Stor	rm Validation Criteria	1		
Y	hrs. (if known)		dry period of at least six hours?	1		
	A 014 :-	377	- 4h-m -m1 4- 0 0580	1		

Y/N	Value	Storm Validation Criteria
Y	hrs. (if known)	Was there an antecedent dry period of at least six hours?
Y	0.94 in.	Was total rainfall greater than or equal to 0.25"?
Y	ハヤマ hrs.	Was runoff duration greater than one hour?

Y	0.75 in.	was total rainfall greater than or equal to 0.25"?	
Y	ペカス hrs.	Was runoff duration greater than one hour?	Rem 10 20/
Y/N	Value	Flow-weighted Composite Sample Validation Criteria	Ram 0.77/0.44
			
		Was greater than 75% of the total volume of the storm sampled?	Flav
Y	50 # subsample	Were at least 10 sub-samples collected at the inlet?	31472/36331
Y	50 # subsample	Were at least 10 sub-samples collected at the outlet?	
	4/0		87%
Was a field (duplicate collected? If so,	Sample ID. Field blank collected? If so, Sample ID.	

Was a field duplicate collected? If so, Sample ID. ______ Field blank collected? If so, Sample ID.

NOTES (including any problems with equipment or maintenance activities performed):

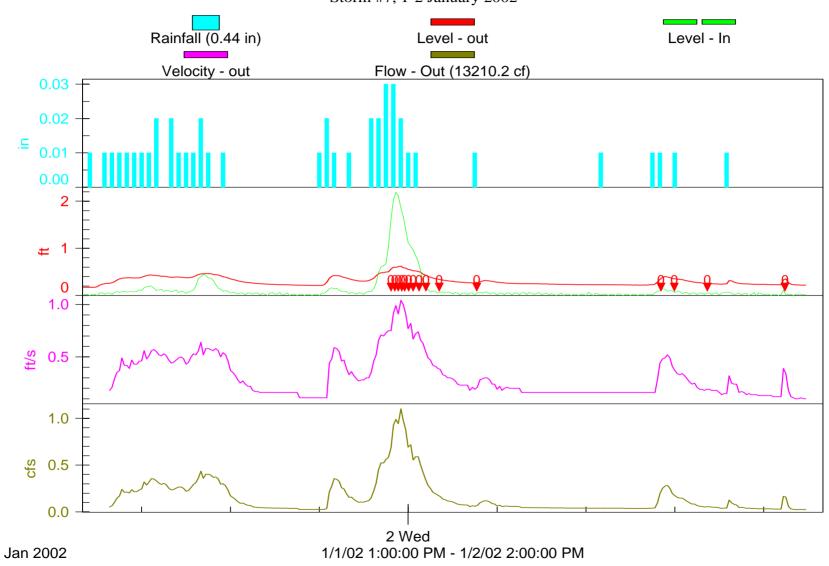
STORM EVENT

NUMBER 7

		•
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•		

SR 405 Vortechnics

Storm #7, 1-2 January 2002



		•
,		
•		



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PROJECT NARRATIVE for B2A0016

Client: Taylor Associates

Project Manager: James Packman Project Name: SR405 Vortechs Project Number: Not Provided

1.0 DESCRIPTION OF CASE

Two (2) water sample were received for the analysis of:

- Total Zinc by EPA 200.8
- Dissolved Zinc by EPA 200.8
- Hardness by SM2340B
- Orthophosphate by EPA 365.2
- Total Phosphorous by EPA 365.2
- Total Suspended Solids by EPA 160.2
- Turbidity
- pH by EPA 150.1

2.0 COMMENTS ON SAMPLE RECEIPT

The samples were received and logged in on 2nd January 2002 at a temperature of 5.8 Degrees C.

Preparation and Analysis

There were no anomalies associated with the preparation and analysis with all QA being within method established criteria. However the following analyses do need to be commented on

Dissolved Zinc

The dissolved metals were filtered and preserved with Nitric Acid in house prior to analysis.

"I certify that this data package is in compliance with the Contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature."

Project Manager

North Creek Analytical



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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 01/15/02 17:15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratery ID	Matrix	Date Sampled	Date Received
VDR-010202-IN	B2A0016-01	Water	01/02/02 12:43	01/02/02 15:30
VDR-010202-OUT	B2A0016-02	Water	01/02/02 12:45	01/02/02 15:30

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Amar Gill, Project Manager

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541.383.931G fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/15/02 17:15

Total Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
/DR-010202-IN (B2A0016-01) Water	Sampled: 01	/02/02 12:43	Received	l: 01/02/02	15:30				
Zine	0.141	0.0100	mg/l	l	2A07011	01/04/02	01/05/02	EPA 200.8	
⁷ DR-010202-OUT (B2A0016-02) Water Sampled: 01/02/02 12:45 Received: 01/02/02 15:30									
Zine	0.118	0.0100	mg/l	1	2A07011	01/04/02	01/05/02	EPA 200.8	

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman Reported:

01/15/02 17:15

Dissolved Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VDR-010202-IN (B2A0016-01) Water	Sampled: 01/	/02/02 12:43	Received	1: 01/02/02	15:30		•		
Zinc	0.0285	0.0100	mg/l	1	2A10022	01/10/02	01/10/02	EPA 200.8	
VDR-010202-OUT (B2A0016-02) Water Sampled: 01/02/02 12:45 Received: 01/02/02 15:30									
Zinc	0.0228	0.0100	rng/l	1	2A10022	01/10/02	01/10/02	EPA 200.8	

North Creek Analytical - Bothell

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541.383.9310 fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/15/02 17:15

Conventional Chemistry Parameters by APHA/EPA Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
./DR-010202-IN (B2A0016-01) Water	Sampled: 01	/02/02 12:43	Received:	01/02/02	15:30	100			
Hardness	38.6	1.00 m	g eq. CaCO3/L	. 1	2A08015	01/08/02	01/11/02	SM 2340B	
)rthophosphate-phosphorus	0.00339	0.00200	mg/l	"	2A05002	01/04/02	01/04/02	EPA 365.2	
.'hosphorus	0.461	0.0100	Ħ	2	2A15024	01/14/02	01/15/02	n,	
рН	7.27		pH Units	1	2A02044	01/02/02	01/02/02	EPA 150.1	
otal Suspended Solids	230	4.0	mg/l	**	2A08002	01/03/02	01/07/02	EPA 160.2	
urbidity	49.3	1.00	NTU	ч	2A02046	01/02/02	01/02/02	EPA 180, I	
VDR-010202-OUT (B2A0016-02) Water	Sampled:	01/02/02 12:	45 Received	d: 01/02/0	2 15:30				
lardness	36.8	1.00 mg	g eq. CaCO3/L	1	2A08015	01/08/02	01/11/02	SM 2340B	
Orthophosphate-phosphorus	ND	0.00200	mg/l	H	2A05002	01/04/02	01/04/02	EPA 365.2	
Phosphorus	0.268	0.00500	n .	n	2A10001	01/08/02	01/08/02	π	
Н	7.16		pH Units	н	2A02044	01/02/02	01/02/02	EPA 150.1	
otal Suspended Solids	140	4.0	mg/l	**	2A08002	01/03/02	01/07/02	EPA 160.2	
~bidity	42.9	1.00	NTU		2A02046	01/02/02	01/02/02	EPA 180.1	

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 01/15/02 17:15

Total Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

		Reporting			Source		%REC		RPD	
Analyte	Result Limit Units Level	Level	Result	%REC	Limits	RPD	Limit	Notes		
Batch 2A07011: Prepared 01/04/02	Using E	PA 200 Sei	ries					<u>-</u>		
Blank (2A07011-BLK1)										
Zine	ND	0.0100	mg/l							
LCS (2A07011-BS1)				-						
Zine	0.210	0.0100	mg/l	0.200		105	85-115			
LCS Dup (2A07011-BSD1)										
Zinc	0.207	0.0100	mg/l	0.200	·	104	85-115	1.44	15	
Duplicate (2A07011-DUP1)					Source: E	32A0040-	01			
Zinc	0.0381	0.0100	mg/l	,	0.0369			3.20	20	
Matrix Spike (2A07011-MS1)					Source: E	32A0040-	01			
Zinc	0.235	0.0100	mg/l	0.200	0.0369	99.0	75-125		·	

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 01/15/02 17:15

Dissolved Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

		Reporting			Source		%REC			
Analyte	Result	Limit	Units	Level	Result	%REC	Límits	RPD	Limit	Notes
Jatch 2A10022: Prepared 01/10	/02 Using E	PA 3005A								
Blank (2A10022-BLK1)	<u> </u>		<u> </u>							
inc	ND	0.0100	mg/l							
LCS (2A10022-BS1)										
Tine	0.212	0.0100	mg/l	0.200		106	85-115			
_CS Dup (2A10022-BSD1)										
Zinc	0.201	0.0100	mg/l	0.200		100	85-115	5.33	15	
Puplicate (2A10022-DUP1)					Source: H	32A0054-	25			
Zinc	ND	0.0100	mg/l		ND	·		1.31	20	
latrix Spike (2A10022-MS1)					Source: I	32A0054-	25			
inc	0.208	0.0100	mg/l	0.200	ND	101	75-125			
trix Spike (2A10022-MS2)					Source: F	32A0072-	02			
ine	0.217	0.0100	mg/l	0.200	0.0134	102	75-125			
Matrix Spike Dup (2A10022-MSD1)					Source: E	32A0054-	25			
Zinc	0.208	0.0100	mg/l	0.200	ND	101	75-125	0.00	20	

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Taylor Associates Inc

Project: SR405 Vortechs

7104 Greenwood Ave N Seattle WA/USA, 98103 Project Number: Not Provided Project Manager: James Packman

Reported: 01/15/02 17:15

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

		Reporting			Spike	Source		%REC	RPD		
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A02044:	Prepared 01/02/02	Using G	ener ai Pre	paration							
Duplicate (2A02044	I-DUP1)					Source: E	32A0016-	02			
рН		7.19		pH Units		7.16			0.418	10	
Batch 2A02046:	Prepared 01/02/02	Using G	eneral Pre	eparation							
Blank (2A02046-BI	L K1)										
Turbidity		ND	1.00	NTU							
LCS (2A02046-BS1)										
Turbidity		18.7	1.00	NTU	20.0		93.5	90-110			
LCS Dup (2A02046	-BSD1)										
Turbidity		18.9	1.00	NTU	20.0		94.5	90-110	1.06	20	
Duplicate (2A02046	5-DUP1)					Source: I	32A0016-	02			
pidity		41.6	1.00	NTU		42.9			3.08	20	
Batch 2A05002:	Prepared 01/04/02	Using G	eneral Pre	paration							
Blank (2A05002-BI	-K1)							•			
Orthophosphate-phosp	horus	ND	0.00200	mg/l							
LCS (2A05002-BS1)										
Orthophosphate-phosp	horus	0.0480	0.00200	mg/l	0.0500		96.0	90-110			
LCS Dup (2A05002	2-BSD1)										
Orthophosphate-phosp	horus	0.0475	0.00200	mg/l	0.0500		95.0	90-110	1.05	20	

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Amar Gill, Project Manager

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/15/02 17:15

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Botheli

			Reporting		Spike	Source		%REC		RPD		
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes	
atch 2A05002:	Prepared 01/04/02	Using G	eneral Pre	paration				-				
Matrix Spike (2A05	5002-MS1)					Source: B	2A0016-0	01			•	
nthophosphate-phosp	horus	0.0506	0.00200	mg/l	0.0500	0.00339	94.4	80-120		•		
Matrix Spike Dup ((2A05002-MSD1)					Source: B	2A0016-0	01				
orthophosphate-phosp.	horus	0.0508	0.00200	mg/l	0.0500	0.00339	94.8	80-120	0.394	25	•	
Batch 2A08002:	Prepared 01/03/02	Using G	Jsing General Preparation									
Blank (2A08002-BI	.K1)											
otal Suspended Solids	s	ND	4.0	mg/l								
Duplicate (2A08002	P-DUP1)	Source: B2A0016-01										
otal Suspended Solids	8	230	4.0	mg/l		230			0.0	19		
Batch 2A08015:	Prepared 01/08/02	Using E	PA 3010A									
ok (2A08015-BI	_K1)						•			_		
lardness		ND	1.00mg	g eq. CaCO3/L				—· · ———				
LCS (2A08015-BS1)											
Tardness		63.2	1.00mg	eq. CaCO3/L	66.2		95.5	70-130				
LCS Dup (2A08015	-BSD1)											
Hardness		63.5	1.00mg	g eq. CaCO3/L	66.2		95.9	70-130	0.474	20		
4atrix Spike (2A08	8015-MS1)					Source: B	1L0659-1	to				
Hardness		321	1.00ms	eq. CaCO3/L	66.2	263	87.6	75-125				

orth Creek Analytical - Bothell

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amar Gill, Project Manager



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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/15/02 17:15

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

	Reporting			Spike	Source	%REC			RPD		
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A08015:	Prepared 01/08/02	Using E	PA 3010A								
Matrix Spike Dup (2A08015-MSD1)						Source: E	1L0659-	10			
Hardness		319	1.00mg	g eq. CaCO3/L	66.2	263	84.6	75-125	0.625	20	
Batch 2A10001:	Prepared 01/08/02	Using G	eneral Prep	paration							
Blank (2A10001-BL	.K1)										
Phosphorus		ND	0.00500	mg/l							
LCS (2A10001-BS1))										
Phosphorus		0.148	0.00500	mg/l	0.150		98.7	90-120			
LCS Dup (2A10001	-BSD1)										
Phosphorus		0.151	0.00500	mg/l	0.150		101	90-120	2.01	20	
Matrix Spike (2A10	001-MS1)					Source: E	32A0039-	04			
phorus		0.0517	0.00500	mg/l	0.0250	0.0236	112	60-139			
Matrix Spike Dup (2A10001-MSD1)				Source: B2A0039-04						
Phosphorus		0.0485	0.00500	mg/l	0.0250	0.0236	99.6	60-139	6.39	25	
Batch 2A15024:	Prepared 01/14/02	Using G	eneral Pre	paration							
Blank (2A15024-BL	.K1)				•						
Phosphorus		ND	0.00500	mg/l							
LCS (2A15024-BS1)										
Phosphorus	· - · - · · · · · · · · · · · · · · · ·	0.136	0.00500	mg/l	0.150		90.7	90-120			

North Creek Analytical - Bothell

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Amar Gill, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network** Page 9 of 11



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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/15/02 17:15

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

<u> </u>			Reporting		Spike	Source		%REC		RPD	•
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
statch 2A15024:	Prepared 01/14/02	Using G	eneral Pre	paration		·					
CS Dup (2A15024	4-BSD1)										
hosphorus		0.137	0.00500	mg/l	0.150		91.3	90-120	0.733	20	
Matrix Spike (2A1:	5024-MS1)					Source: I	32A01 0 5-	02			
hosphorus		2.50	0.125	mg/l	0.626	1.92	92.7	60-139			
Aatrix Spike Dup ((2A15024-MSD1)					Source: I	32A0105-	02			
Phosphorus		2.42	0.125	mg/l	0.626	1.92	79.9	60-139	3.25	25	

Torth Creek Analytical - Bothell

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North Creek Analytical, Inc. **Environmental Laboratory Network**

Page 10 of 11

Particle Size Distribution Analysis Results

Report Prepared for: Ingrid Weltz **Taylor Associates** Tel: 206.633,4486

Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact: Dr. David Stensel Tel: 206.543.9358

Size Volume Carrolletye Lieu

Project ID:

SR405 Vortechnics

Sample ID:

VOR-010202-IN-PSD

Date and Time Collected:

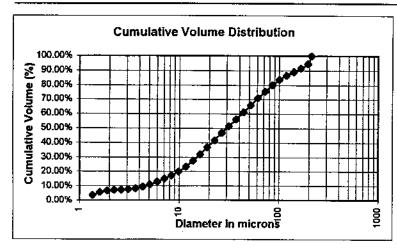
1/2/02

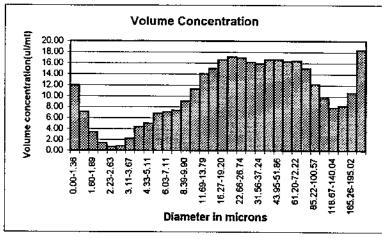
12:43

Date and Time of PSD Analysis:

1/3/02

11:39





	************	- continents	Marae
Range	Concentration	Volume	
(microns)	(4/1)	(%)	(mg)
0.00-1.36	11.95	3.53%	7.94
1.36-1.60	7.08	5.63%	4.70
1.60-1.89	3.39	6.63%	2.25
1.89-2.23	1.42	7.05%	0.94
2.23-2.63	0.73	7.27%	0.49
2.63-3.11	0.85	7.52%	0.57
3.11-3.67	2.18	8.16%	1.45
3.67-4.33	4.36	9.45%	2.90
4.33-5.11	5.00	10.93%	3.32
5.11-6.03	6.81	12.95%	4.52
6.03-7.11	7.10	15.05%	4.72
7.11-8.39	7.40	17.24%	4.92
8.39-9.90	9.02	19.91%	6.00
9.90-11.69	11.25	23.23%	7.47
11.69-13.79	14.05	27.39%	9.33
13.79-16.27	14.99	31.82%	9.96
16.27-19.20	16.56	36.72%	11.00
19.20-22.66	17.11	41.78%	11.36
22.66-26.74	16.93	46,79%	11.25
26.74-31.56	16.18	51.57%	10.75
31.56-37.24	15.85	56.26%	10.53
37.24-43.95	16.65	61,18%	11.06
43.95-51.86	16.63	66.10%	11.05
51.86-61.20	16.28	70.92%	10.81
61.20-72.22	16.43	75.78%	10.91
72.22-85.22	15.01	80.21%	9.97
85.22-100.57	12.13	83.80%	8.06
100.57-118.67	9.66	86.66%	6.42
118.67-140.04	7.92	89.00%	5.26
140.04-165.26	8.18	91.42%	5.43
165.26-195.02	10.59	94.55%	7.04
195.02-212	18.42	100.00%	12.23
Total	338.10		224.60

Computed Statistics:

Weight Mean = 57.24 microns

 $D_{10} =$ 4.33 microns 26.74 microns $D_{90} = 140.04 \text{ microns}$

Volume of Sample:

925 ml

Volume of Dilution: 2075 ml added

Comments: ~10ml of the <212 fraction was spilled after PSA so only TSS value should be affected.

The TSS value for this size fraction will consequently be slightly lower as a result.

Size Range

(microns)

< 212

212-425

425-850

>850

Total

Mass of TSS

(mg)

224.60

15.80

6.80

16.50

263.70

% Mass

TSS

85.17%

5.99%

2.58%

6.26%

100.00%

Particle Size Distribution Analysis Results

Report Prepared for: Ingrid Weltz **Taylor Associates**

Tel: 206.633.4486

Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact: Dr. David Stensel Tel: 206.543.9358

Size Volume Sumulative Mass

Project ID:

SR405 Vortechnics

Sample ID:

VOR-010202-OUT-PSD

Date and Time Collected:

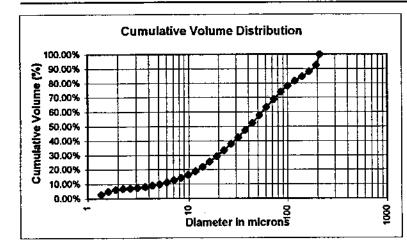
1/2/02

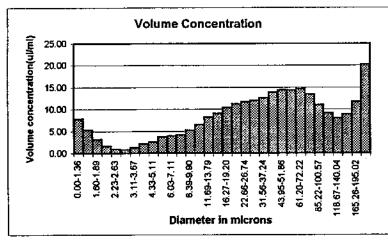
12:45

Date and Time of PSD Analysis:

1/3/02

3:25





	VUICE III		810550
	Concentration		
(microns)	(ul / I)	(%)	(TG)
0.00-1.36	7.88	2.98%	3.65
1.36-1.60	5.34	5.00%	2.47
1.60-1.89	3.17	6.20%	1.47
1.89-2.23	1.72	6.85%	0.80
2.23-2.63	0.98	7.22%	0.45
2.63-3.11	0:80	7.52%	0.37
3.11-3.67	1.28	8.00%	0.59
3.67-4.33	2.17	8.83%	1.01
4.33-5.11	2.57	9.80%	1,19
5.11-6.03	3.74	11.21%	1.73
6.03-7.11	3.95	12.70%	1.83
7.11-8.39	4.24	14.30%	1.96
8.39-9.90	5.34	16.32%	2.47
9.90-11.69	6.59	18.81%	3.05
11.69-13.79	8.27	21.93%	3.83
13.79-16.27	9.04	25.35%	4.18
16.27-19.20	10.41	29.28%	4.82
19.20-22.66	11.19	33.51%	5.18
22.66-26.74	11.69	37.93%	5.41
26.74-31.56	12.00	42.47%	5.56
31.56-37.24	12.58	47.22%	5.82
37.24-43.95	13.89	52.47%	6.43
43.95-51.86	14.38	57,90%	6.66
51.86-61.20	14.31	63.31%	6.62
61.20-72.22	14.62	68.84%	6.77
72.22-85.22	13.44	73.92%	6.22
85.22-100.57	11.00	78.07%	5.09
100.57-118.67	9.16	81.54%	4.24
118.67-140.04	8.06	84.58%	3.73
140.04-165.26	8.90	87.95%	4.12
165.26-195.02	11.72	92.37%	5.42
195.02-212	20.18	100.00%	9.34
Total	264,61		122.50

Computed Statistics:

Weight Mean = 69.19 microns

5.11 microns $D_{10} =$ 37.24 microns $D_{90} = 165.26 \text{ microns}$

Volume of Sample: Volume of Dilution:

950 ml 1050 ml added

Comments: 1/0/00

425-850 2.50 >850 4.40 Total 132.00

Size Range

(microns)

< 212

212-425

Mass of TSS

(mg)

122.50

2.60

92.80%

1.97%

1.89%

3,33% 100.00%

		SITE VISIT	r sheet (sr	. 405 Vortechs	^{rm} Monitoring)	
	Date/Time	12/3/10/ 12:30	Field Staff 3	Weatl	ner douby +mis	tina
		Pre-Str	rom Visit or - Po		ircle one)	_ 4
		INLET			<u>OUTLET</u>	
	Check Curre	ent Readings / Downloa	d:	Check Cu	rrent Readings / Download	d:
	ISCO	Time? reset (Y/N)? Time downloaded	13:00,10 12/31	ISCO	Time? reset (Y/N)? Level (ft.)	12:47 12/31 0,208
		level.	0.026	•	Velocity (f/s) Flow (cfs) Total Flow (cf) Sig/Spec str.	37315 0/4
			<u>Pre - :</u>	Storm Visit	Time downloaded offset = 0.145	14
	Battery (V)	INLET	17.20	Battery (V)	OUTLET &	40 3.0
	Clean bottle (Y/N)?	12-30-	Clean bottl	•	12-30V
		ok (Y/N)? Replaced?			ng ok (Y/N)? Replaced?	$\frac{Y}{N}$
	Sampler tubin			-	bing ok (Y/N)?	
	Strainer ok?	-8 (-1)1		Strainer ok	• •	
		t ok (Y/N)? Changed?	Y		ant ok (Y/N)? Changed?	
		ok (Y/N)? Changed?	Ÿ		ant ok (Y/N)? Changed?	
	Measure Dn 1				n level? Ok?	
	Sample Volu	me (ml)	200 ml	Enable leve		> 0.55
	Inspect Rain	Gage	Y-01	Pacing (cf)	/ Sample Volume (ml)	400
	Sampler enab		Ÿ	Sampler en	nabled? (Y/N)	
2 S. 49	Delay to s	stort		Dela	, to start 17:00 The	not 54 12/21
///	,		Post -	Storm Visit 7	•	, , ,
		INLET			<u>OUTLET</u>	
		an Completely?			Ran Completely?	
	•	oled (date/time)?			nabled (date/time)?	<u> </u>
		egan (date/time)?	·		Began (date/time)?	
		bsamples taken?			subsamples taken?	
		le collection errors?			nple collection errors?	
	Last Sample (e (date/time)?	
		Volume Collected (ml)			e Volume Collected (ml)	
	Sample ID?	\		Sample ID	t .	
	Y/N	Value	\	Storm Walidation	Criteria	¬
	2/14	7 AUC	***	Storm's andation	Criteria	_

Y/N	Value	Storm, Validation Criteria
	hrs. (if known)	Was there an antecedent dry period of at least six hours?
	in.	Was total rainfall greater than or equal to 0.25"?
	hrs.	Was runoff duration greater than one hour?

Y/N	Value	Flow-weighted Composite Sample Validation Criteria
		Was greater than 75% of the total volume of the storm sampled?
<u> </u>		Were at least 10 sub-samples collected at the inlet?
	# subsample,	Were at least 10 sub-samples collected at the outlet?

Was a field duplicate collected? If so, Sample ID. ______ Field blank collected? If so, Sample ID. _____

NOTES (including any problems with equipment or maintenance activities performed):

SITE VISIT	SHEET (SR 405 V	ortechs TM Monitoring)	
Date/Time 1/2/02 13:00	Field Staff	Weather ofly clouds	_
Pre-Str	om Visit - or Post-Storm	Visit (circle one)	
INLET		OUTLET	
Check Current Readings / Downloa	d:	Check Current Readings / Download:	
ISCO Time? reset (Y/N)?	(3: 10	ISCO Time? reset (Y/N)?	13:17, N
Time downloaded	13:40	Level (ft.)	0.222.
ievel -	9.026	Velocity (f/s)	0.11
level -		Flow (cfs)	0.025
		Total Flow (cf)	9327
		Sig/Spec str.	37./88%
	- ~. ~	Time downloaded	13:30
PRIN ENST	<u> Pre - Storm V</u>	OUTLET	
<u>INLET</u>		Battery (V)	
Battery (V) Clean bottle (Y/N)?		Clean bottle (Y/N)?	
Pump tubing ok (Y/N)? Replaced?		Pump tubing ok (Y/N)? Replaced?	
Sampler tubing ok (Y/N)?	X	Sampler tubing ok (Y/N)?	
Strainer ok?		Strainer ok?	
Ext. desiccant ok (Y/N)? Changed?	 /	Ext. desiccant ok (Y/N)? Changed?	
Int. desiccant ok (Y/N)? Changed?	/	Int. desiccant ok (Y/N)? Changed?	
Measure Dn level? Ok?		Measure On level? Ok?	
Sample Volume (ml)		Enable level (ft)	
Inspect Rain Gage		Pacing (cf) / Sample Volume (ml)	
Sampler enabled? (Y/N)		Sampler enabled? (Y/N)	
	Post - Storm V	7isit	
INLET		OUTLET	
Equipment Ran Completely?	\mathcal{N}	Equipment Ran Completely?	
Sampler Enabled (date/time)?	23:23 1/1	Sampler Enabled (date/time)?	23:25 1/1
Composite Began (date/time)?	23:23	Composite Began (date/time)?	23:25
Number of subsamples taken?	15 (14 ? 13?)	Number of subsamples taken?	12
Any subsample collection errors?		Any subsample collection errors?	_ <i>N</i>
Last Sample (date/time)?	12:41 1/2	Last Sample (date/time)?	12. 43 1/2
Est. Sample Volume Collected (ml)	3.2 L	Est, Sample Volume Collected (ml)	VOR -010202-00
Sample ID?	JOR-010202-IN	Sample ID?	VOK -010202-01
Y/N Value	Storm	Validation Criteria]
hrs. (if known)	Was there an antecedent dr	ry period of at least six hours?]
ў О, 44 in.	Was total rainfall greater th	han or equal to 0.25"?]
24 hrs.	Was runoff duration greate	r than one hour? $(3:30 - (3:4))$	
Y/N Value	Flow weighted Com	posite Sample Validation Criteria	Ram 0.27 /2.
		ne total volume of the storm sampled?	
	Were at least 10 sub-sampl		1 Plan
	Were at least 10 sub-sampl		Plan 10352/13712
Was a field duplicate collected? If so,	· · · · · · · · · · · · · · · · · · ·	Field blank collected? If so, Sample ID	7507
·		activities performed):	
NOTES (including any problems with	tuling replaces	I am West a recet pan	no counter
1 - 1	J H.		
Taylor Associates • Took \$	ample in element	I am invest a reset prim 3sed 18 part of events	10/5/01

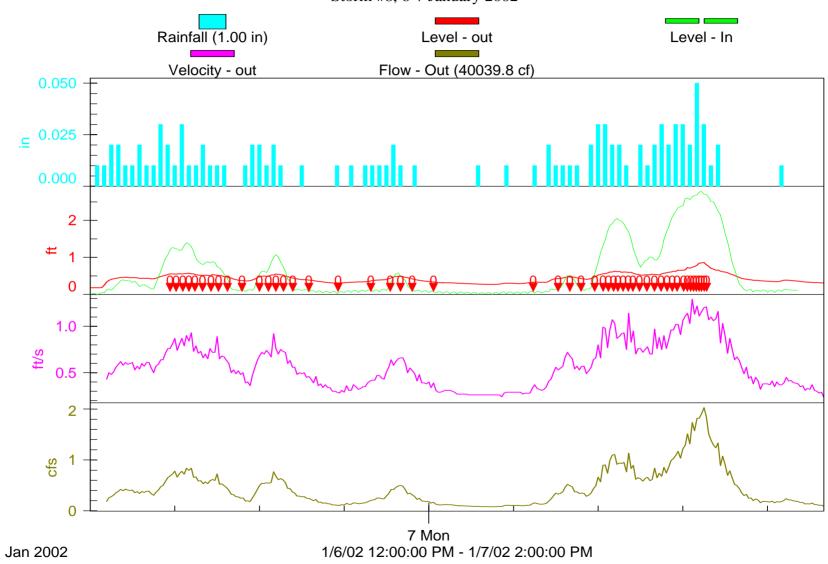
STORM EVENT

NUMBER 8

		•
,		
•		

SR 405 Vortechnics

Storm #8, 6-7 January 2002



		•
,		
•		



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PROJECT NARRATIVE for B2A0072

Client: Taylor Associates

Project Manager: James Packman Project Name: SR405 Vortechs Project Number: Not Provided

1.0 DESCRIPTION OF CASE

Two (2) water sample were received for the analysis of:

- Total Zinc by EPA 200.8
- Dissolved Zinc by EPA 200.8
- Hardness by SM2340B
- Orthophosphate by EPA 365.2
- Total Phosphorous by EPA 365.2
- Total Suspended Solids by EPA 160.2
- Turbidity
- pH by EPA 150.1

2.0 COMMENTS ON SAMPLE RECEIPT

The samples were received and logged in on 7th January 2002 at a temperature of 10.8 Degrees C; this is outside the recommended temperature range of 2 to 6 Degrees C. Since the samples were received shortly after collection and may not have had time to equilibrate with the coolant a temperature range of 2 to 15 Degrees C is considered acceptable.

Preparation and Analysis

There were no anomalies associated with the preparation and analysis with all QA being within method established criteria. However the following analyses do need to be commented on

Dissolved Zinc

The dissolved metals were filtered and preserved with Nitric Acid in house prior to analysis.

"I certify that this data package is in compliance with the Contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature."

Project Manager

North Creek Analytical



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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/18/02 10:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
VOR-010702-IN	B2A0072-01	Water	01/07/02 09:52	01/07/02 14:20
VOR-010702-OUT	B2A0072-02	Water	01/07/02 09:53	01/07/02 14:20

North Creek Analytical - Bothell

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Amar Gill, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network** Page 1 of 11



11720 NOTE: CTER FRWY N, SUILE 443, DOLLIER, VVA 30011-0294 425.420.9200 fax 425.420.9210 East 11115 Montgomery, Suite B, Spokane, WA 99206-4776

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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 01/18/02 10:31

Total Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes	
VOR-010702-IN (B2A0072-01) Water	Sampled: 01	/07/02 09:52	Received	d: 01/07/02	14:20					
Zinc	0.0684	0.0100	mg/l	1	2A08029	01/08/02	01/09/02	EPA 200.8		
VOR-010702-OUT (B2A0072-02) Water Sampled: 01/07/02 09:53 Received: 01/07/02 14:20										
Zinc	0.0636	0.0100	mg/l	1	2A08029	01/08/02	01/09/02	EPA 200.8		

Torth Creek Analytical - Bothell

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Amar Gill, Project Manager



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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/18/02 10:31

Dissolved Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VOR-010702-IN (B2A0072-01) Water	Sampled: 01	/07/02 09:52	Received	d: 01/07/02	14:20				
Zinc	0.0183	0.0100	mg/l	į.	2A10022	01/10/02	01/10/02	EPA 200.8	
VOR-010702-OUT (B2A0072-02) Wate	r Sampled:	01/07/02 09:5	3 Recei	ved: 01/07/0	02 14:20				
Zine	0.0134	0.0100	mg/l	1	2A10022	01/10/02	01/10/02	EPA 200.8	

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Page 3 of 11



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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 01/18/02 10:31

Conventional Chemistry Parameters by APHA/EPA Methods North Creek Analytical - Bothell

		Reporting			•				
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
VOR-010702-IN (B2A0072-01) Water	Sampled: 01	1/07/02 09:52	Received:	01/07/02	14:20				
Hardness	28.7	1.00 mg	g eq. CaCO3/L	. 1	2A15015	01/15/02	01/17/02	SM 2340B	
Orthophosphate-phosphorus	0.0275	0.00200	mg/l		2A08030	01/08/02	01/08/02	EPA 365.2	
рН	7.02		pH Units	н	2A07050	01/07/02	01/07/02	EPA 150.1	
Total Suspended Solids	80	4.0	mg/l	n	2A11022	01/08/02	01/09/02	EPA 160.2	
Turbidity	32.4	1.00	NTU	rr	2A07049	01/07/02	01/07/02	EPA 180.1	
VOR-010702-IN (B2A0072-01RE1) Wa	ter Sample	d: 01/07/02 0	9:52 Receiv	ved;-0170°	7/02 14:20	I			
Phosphorus	0.540	0.0250	mg/l	/ 5	2A15024	01/14/02	01/15/02	EPA 365.2	
VOR-010702-OUT (B2A0072-02) Wate	r Sampled:	01/07/02 09:	53 Receive	d: 0 <u>1</u> /07/(32 14:20				
Hardness	29.1	1.00 mg	eq. CaCO3/L]	2A15015	01/15/02	01/17/02	SM 2340B	
Orthophosphate-phosphorus	0.00640	0.00200	mg/l	н	2A08030	01/08/02	01/08/02	EPA 365.2	
Phosphorus	0.184	0.00500	n	п	2A10002		u,	#	
л Ц	7.12		pH Units		2A07050	01/07/02	01/07/02	EPA 150.1	
al Suspended Solids	63	4.0	mg/l	»	2A11022	01/08/02	01/09/02	EPA 160.2	
Turbidity	31.3	1.00	NTU		2A07049	01/07/02	01/07/02	EPA 180.1	

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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Project: SR405 Vortechs Taylor Associates Inc

7104 Greenwood Ave N Project Number: Not Provided Project Manager: James Packman Seattle WA/USA, 98103

Reported: 01/18/02 10:31

Total Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A08029:	Prepared 01/08/02	Using El	PA 200 Ser	ies							
Blank (2A08029-Bl	LK1)									•	
Zinc		ND	0.0100	mg/l							
LCS (2A08029-BS1	1)										
Zinc	·	0.214	0.0100	mg/l	0.200		107	85-115			
LCS Dup (2A98029	P-BSD1)										
Zinc		0.211	0.0100	mg/l	0.200		106	85-115	1.41	15	
Duplicate (2A08029	9-DUP1)					Source: E	32A0036-	01			
Zinc		0.0914	0.0100	mg/l		0.0902			1.32	20	
Matrix Spike (2A08	8029-MS1)					Source: E	32A0036-	01			
Zinc		0.285	0.0100	mg/l	0.200	0.0902	97.4	75-125			
trix Spike (2A0)	8029-MS2)					Source: E	32A0037-	01			
Zinc	_	0.260	0.0100	mg/l	0.200	0.0642	97.9	75-125			

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Amar Gill, Project Manager



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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/18/02 10:31

Dissolved Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	-
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A10022:	Prepared 01/10/02	Using El	PA 3005A								
Blank (2A10022-BL)	K1)		- ·-								
Zinc		ND	0.0100	mg/l							
LCS (2A10022-BS1)											
Zinc	·	0.212	0.0100	mg/l	0.200		106	85-115			•
LCS Dup (2A10022-	BSD1)										
Zinc		0.201	0.0100	mg/l	0.200		100	85-115	5.33	15	
Duplicate (2A10022-	DUP1)					Source: B	32A0054-	25			
Zinc		ND	0.0100	mg/l	••	ND			1.31	20	
Matrix Spike (2A100	022-MS1)					Source: B	32A0054-	25			
Zinc		0.208	0.0100	mg/l	0.200	ND	101	75-125			
rix Spike (2A100)22-MS2)					Source: B	32A0072-	02			
z.mc		0.217	0.0100	mg/l	0.200	0.0134	102	75-125			
Matrix Spike Dup (2	A10022-MSD1)					Source: E	32A0054-	25			
Zinc		0.208	0.0100	mg/l	0.200	ND	101	75-125	0.00	20	



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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/18/02 10:31

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A07049:	Prepared 01/07/02	Using G	eneral Pre	paration				•			
Blank (2A07049-BI	.K1)										
Turbidity		ND	1.00	NTU							
LCS (2A07049-BS1)										
Turbidity		18.8	1.00	NTU	20.0		94.0	90-110			
LCS Dup (2A07049	-BSD1)										
Turbidity		8.81	1.00	NTU	20.0		94.0	90-110	0.00	20	
Duplicate (2A07049	-DUP1)					Source: B	2A0067-	01			
Turbidity		18.2	1.00	NTU	-	18.8			3.24	20	
Batch 2A07050:	Prepared 01/07/02	Using G	eneral Pre	paration							
Duplicate (2A07050	-DUP1)					Source: B	2A0072-	01			
		7.06		pH Units		7.02			0.568	10	
Batch 2A08030:	Prepared 01/08/02	Using G	eneral Pre	paration							
Blank (2A08030-BL	.K1)										
Orthophosphate-phosph	orus	ND	0.00200	mg/I			-				
LCS (2A08030-BS1))										
Orthophosphate-phospl	വാ	0.158	0.00200	mg/l	0.150		105	90-110			
LCS Dup (2A08030	-BSD1)										
Orthophosphate-phosph	norus	0.159	0.00200	mg/l	0.150		106	90-110	0.631	20	

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Taylor Associates Inc

7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/18/02 10:31

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A08030:	Prepared 01/08/02	Using G	eneral Pre	paration							
Matrix Spike (2A0)	8030-MS1)					Source: E	32A0072-	02			
Orthophosphate-phosp	horus	0.0584	0.00200	mg/l	0.0499	0.00640	104	80-120			
Matrix Spike Dup ((2A08030-MSD1)					Source: E	32A0072-	02			
Orthophosphate-phosp	horus	0.0584	0.00200	mg/I	0.0499	0.00640	104	80-120	0.00	25	
Batch 2A10002:	Prepared 01/08/02	Using G	eneral Pre	paration							
Blank (2A10002-Bl	LK1)			··							
Phosphorus		ND	0.00500	mg/l							
LCS (2A10002-BS1	l)										
Phosphorus		0.147	0.00500	mg/l	0.150		98.0	90-120		···	
LCS Dup (2A10002	2-BSD1)										
phorus		0.149	0.00500	mg/i	0.150		99.3	90-120	1.35	20	
Matrix Spike (2A1)	0002-MS1)					Source: E	32A0072-	01			
Phosphorus	.,	0.721	0.0250	mg/l	0.0250	0.599	488	60-139			Q-15
Matrix Spike Dup	(2A10002-MSD1)					Source: E	32A0072-	01			
Phosphorus	<u> </u>	0.718	0.0250	mg/l	0.0250	0.599	476	60-139	0.417	25	Q-1:
Batch 2A11022:	Prepared 01/08/02	Using G	eneral Pre	paration							
Blank (2A11022-BI	LK1)	•			·	·		·			
Total Suspended Solid	s	ND	4.0	mg/l							

North Creek Analytical - Bothell

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided

Reported: 01/18/02 10:31

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

Project Manager: James Packman

			Reporting		Spike	Source		%REC		₽₽D	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A11022:	Prepared 01/08/02	Using G	eneral Pre	paration	,						
Duplicate (2A11022	-DUP1)					Source: I	32A0071-	01			
Total Suspended Solid	5	ND	4,0	mg/l		ND			40	19	Q-07
Batch 2A15015:	Prepared 01/15/02	Using E	PA 3010A								
Blank (2A15015-BI	.K1)										
Hardness		ND	1.00mg	g eq. CaCO3/L							
LCS (2A15015-BS1)										
Hardness		65.4	t.00mg	g eq. CaCO3/L	66.2		98.8	70-130			
LCS Dup (2A15015	-BSD1)										
Hardness		65.3	1.00mg	g eq. CaCO3/L	66.2		98.6	70-130	0.153	20	
Matrix Spike (2A15	5015-MS1)					Source: I	32A0134-	02			
tness		597	1.00mg	g eq. CaCO3/L	66.2	529	103	75-125			
Matrix Spike Dup (2A15015-MSD1)					Source: I	32A0134-	02			
Hardness		604	1.00mg	g eq. CaCO3/L	66.2	529	113	75-125	1.17	20	
Batch 2A15024:	Prepared 01/14/02	Using G	eneral Pre	paration							
Blank (2A15024-BI											
Phosphorus		ND	0.00500	mg/l							
LCS (2A15024-BS1)										
Phosphorus		0.136	0.00500	mg/l	0.150	•	90.7	90-120	~		

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 01/18/02 10:31

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting	•	Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A15024:	Prepared 01/14/02	Using G	eneral Pre	paration			,				
LCS Dup (2A15024-	-BSD1)									•	
Phosphorus		0.137	0.00500	mg/l	0.150		91.3	90-120	0.733	20	
Matrix Spike (2A15	024-MS1)					Source: I	32A0105-	02			
Phosphorus	··	2.50	0.125	mg/l	0.626	1.92	92.7	60-139			
Matrix Spike Dup (2	2A15024-MSD1)					Source: I	32A0105-	02			
Phosphorus		2.42	0.125	mg/l	0.626	1.92	79.9	60-139	3.25	25	

			<u> </u>
Comments/Special Notes: 2/3 battles are 1L 1/3 bottle is 8.5 L	JOR-010702-001	SR405 Vortechs Monitoring Project SR405 Vortechs Monitoring Project Date Time # of Collected Collected Comp? Grab? contain. n	Sample Collection by: Client: TAYLOR ASSOCIATES WSD(Contact: James Packman Contac Tel: 206.781.1487 Tel: 20 Laboratory: North Creek Analytical Contact: Amar Gill Tel: 425.420.9232
\$L	1/702	ortechs Date Collected	Client: WSDOT Contact: Jay Carnar Tel: 206,440,5070 alytical or
	<u>Ø(+>\$)</u>	TM Mo	іелік
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Relinquished by: Signature Printed Name Company Date/Time Printed by: Signature Printed Name Company Date/Time	2	Grab?	CHA) yer University of Wash Contact: David Str Tel: 206.543.9358
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e lby:	7	Ortho-P	Page: / Project ID: 5/2 ase File #: corded by: Analysis Required
		PSD	
		Other?	of of
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		Outer	worte
		Notes	

Particle Size Distribution Analysis Results

Report Prepared for: Ingrid Weltz Taylor Associates Tel: 206.633.4486 Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact: Dr. David Stensel Tel: 206.543.9358

Project ID:

SR405 Vortechs

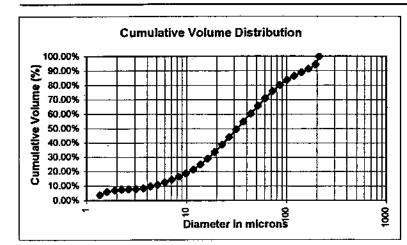
Sample ID:

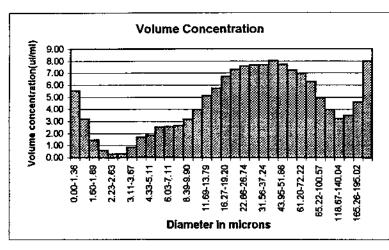
VOR-010702-IN

Date and Time Collected:
Date and Time of PSD Analysis:

1/7/02

0.41111111 0.565277778





		Mace
000000000000000000000000000000000000000		
		(iii)
5.52	3.87%	3.14
3.18	6.10%	1.81
1.47	7.12%	0.84
0.59	7.53%	0.33
0.29	7.74%	0.16
0.33	7.97%	0.19
0.84	8.56%	0.48
1.66	9.72%	0.95
1.86	11.02%	1.06
2.52	12.79%	1.44
2.57	14.59%	1.46
2.65	16.44%	1.51
3.18	18.67%	1,81
3.98	21.46%	2.27
5.12	25.04%	2.91
5.74	29.06%	3.27
6.68	33.74%	3.80
7.29	38.85%	4.15
7.58	44.15%	4.31
7.64	49.50%	4.35
7.68	54.87%	4.37
8.02	60.49%	4.57
7.70	65.88%	4.38
7.23	70.94%	4.12
6.95	75.81%	3.96
6.28	80.21%	3.57
4.98	83.69%	2.83
3.97	86.47%	2.26
3.23	88.73%	1.84
3.51	91.19%	2.00
4.59	94.40%	2.61
8.00	100.00%	4.55
142.82	<u> </u>	81.30
	3.18 1.47 0.59 0.29 0.33 0.84 1.66 1.86 2.52 2.57 2.65 3.18 3.98 5.12 5.74 6.68 7.29 7.58 7.64 7.68 8.02 7.70 7.23 6.95 6.28 4.98 3.97 3.23 3.51 4.59 8.00	Concentration (9.17) (9.6) (9.6) (9.17) (9.6) (9

Computed Statistics:			
Weight Mean =	58.32	microns	
D ₁₀ =	4.33	microns	
$D_{50} =$	31.56	microns	
D ₉₀ =	140.04	microns	

Volume of Sample: 1000 ml Volume of Dilution: 1000 ml added

Comments: 1/0/00

Size Range	Mass of TSS	% Mass
(microns) < 212	(mg) 81.30	99.15%
212-425	0.50	0.61%
425-850	0.10	0.12%
>850	0.10	0.12%
Total	82.00	100.00%

Particle Size Distribution Analysis Results

Report Prepared for: Ingrid Weltz Taylor Associates Tel: 206.633.4486 Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact Dr. David Stensel Tel: 206.543.9358

Project ID:

SR405 Vortechs

Sample ID:

VOR-010702-OUT

Date and Time Collected:

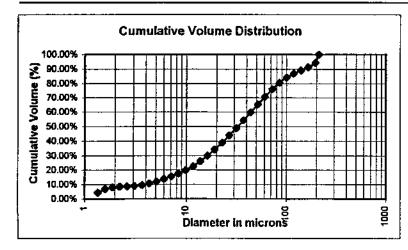
1/7/02

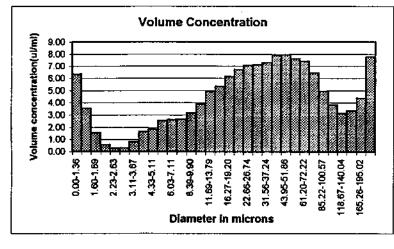
0.411805556

Date and Time of PSD Analysis:

1/8/02

0.420833333





366		CHITHINITY	1/1055
Range	Concentration	Volume	
(microns)	(9/71)	(%)	(mg)
0.00-1.36	6.33	4.49%	2.97
1.36-1.60	3.54	7.00%	1.66
1.60-1.89	1.57	8.11%	0.74
1.89-2.23	0.60	8.53%	0.28
2.23-2.63	0.28	8.73%	0.13
2.63-3.11	0.31	8.95%	0.15
3.11-3.67	0.83	9.54%	0.39
3.67-4.33	1.68	10.73%	0.79
4.33-5.11	1.86	12.05%	0.87
5.11-6.03	2.55	13.85%	1.20
6.03-7.11	2.62	15.71%	1.23
7.11-8.39	2.65	17.59%	1.24
8.39-9.90	3.15	19.82%	1.48
9.90-11.69	3.89	22.58%	1.83
11.69-13.79	4.91	26.06%	2.30
13.79-16.27	5.33	29.83%	2.50
16.27-19.20	6.13	34.17%	2.87
19.20-22.66	6.73	38.94%	3.15
22.66-26.74	7.07	43.95%	3.32
26.74-31.56	7.12	48.99%	3.34
31.56-37.24	7.31	54.17%	3.43
37.24-43.95	7.89	59,76%	3.70
43.95-51.86	7.95	65.39%	3.73
51.86-61.20	7.61	70.78%	3.57
61.20-72.22	7.40	76.02%	3.47
72.22-85.22	6.43	80.57%	3.01
85.22-100.57	4.94	84.07%	2.32
100.57-118.67	3.83	86.79%	1.80
118.67-140.04	3.14	89.01%	1,47
140.04-165.26	3.35	91.38%	1.57
165.26-195.02	4.39	94,49%	2.06
195.02-212	7.77	100.00%	3.64
Total	141.19		66.20

Computed Statistics:

Weight Mean = 57.95 microns

 $D_{10} = 3.67$ microns $D_{50} = 31.56$ microns

 $D_{90} = 140.04 \text{ microns}$

Volume of Sample: Volume of Dilution:

950 ml 550 ml added

Comments: 1/0/00

Size Range (enicrons)	Mass of TSS (mg)	% Mass
< 212	66.20	97.21%
212-425	0.60	0.88%
425-850	0.10	0.15%
>850	1.20	1.76%
Total	68.10	100.00%

	SITE VISIT	r sheet (SR 405 Vortech	s TM Monitoring)	
Date/Time	116 for 08:00	Field Staff	JP Wes	other_cloudy	
	Pre-St	rom Visit or -	Post-Storm Visit ((circle one)	
	INLET			<u>OUTLET</u>	
Check Curr	ent Readings / Downloa	ıd: ,	Check C	urrent Readings / Downlo	nad: 02 19
ISCO	Time? reset (Y/N)?	8:17	ISCO	Time? reset (Y/N)?	
	Time downloaded			Level (ft.)	0.183
	level -	0.026		Velocity (f/s)	0.10x
				Flow (cfs)	Ø
				Total Flow (cf)	<u> 4333</u>
				Sig/Spec str.	<u>Ø</u> / Ø
		ν	e - Storm Visit	Time downloaded	
	INLET	<u>EI</u>	e - Storm visit	<u>OUTLET</u>	
Battery (V)		17-5	Battery (12.Z
Clean bottle	(Y/N)?		• •	ttle (Y/N)?	<u> </u>
Pump tubing	ok (Y/N)? Replaced?	Y		oing ok (Y/N)? Replaced?	
Sampler tubi	ng ok (Y/N)?	<u> </u>		tubing ok (Y/N)?	
Strainer ok?			Strainer (<u> </u>	
	t ok (Y/N)? Changed?	<u> </u>	Ext. desic	ccant ok (Y/N)? Changed?	<u> </u>
	tok (Y/N)? Changed?	<u> </u>		cant ok (Y/N)? Changed?	. <u>Y</u>
Measure Dn				Dn level? Ok?	_
Sample Volu		590-1	Enable le		70.55
Inspect Rain	_	okc		f) / Sample Volume (ml)	<u>/900</u>
Sampler enab	olear (Y/N)	<u>·Y</u>	Sampler	enabled? (Y/N)	
		Pos	st - Storm Visit		no delay
	<u>INLET</u>			<u>OUTLET</u>	2464
	an Completely?		Equipme	nt Ran Completely?	
	bled (date/time)?			Enabled (date/time)?	
	egan (date/time)?	$\overline{}$		te Began (date/time)?	
	bsamples taken?			of subsamples taken?	
Last Sample	de collection errors?		Any subs	ample collection errors?	
_	Volume Collected (ml)		Last Sam	ple (date/time)?	
Sample ID?	volume conceied (IIII)		Sample II	ple Volume Collected (ml)	
oumpio 125 ;			Sample in	D.	
Y/N	Value		Storm Validation	n Criteria	
	hrs. (if known)	Was there an ar	ntecedent dry period of	at least six hours?	
	in	Was total rainfa	ll greater than or equa	1 to 0.25"?	
	hrs.	Was runoff dura	tion greater than one l	hour?	7
Y/N	Value			ple Validation Criteria	
· · · · · · · · · · · · · · · · · · ·	% (approx.)	Was greater tha	n 75% of the total volu	ine of the storm sampled?	
-	# subsample	Were at least 10	sub-samples collected	at the inlet?	\dashv
t	# suosample	were ar least 10	sub-samples collected	at the outlet?	
Was a field du	plicate collected? If so,	Sample ID	Field blar	ik collected? If so, Sample 1	m.
	1		rion oldi	E COUCCUL II SO, DAMPIE I	<u> </u>
NOTES (inclu	iding any problems with	equipment or m	aintenance activities p	erformed):	

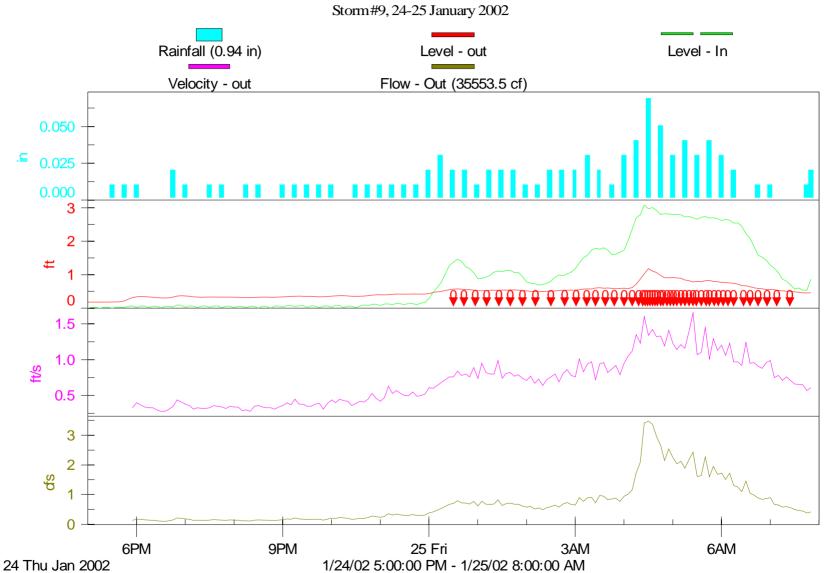
SITE VISIT SHEET (SR 405 Vortechs **Monitoring)

Date/Time 1/7/02 12:45 Field Staff 7/2	Weather light rain
Pre-Strom Visit - or - Post-Storm	
INLET	OUTLET
Check Current Readings / Download:	Check Current Readings / Download:
ISCO Time? reset (Y/N)? 1725 N	ISCO Time? reset (Y/N)? 12:55: W
Time downloaded 12:44	Level (ft.) $\theta \cdot 3 \leftarrow 7$
level 0.121	Velocity (f/s)
level	Flow (cfs)
	Total Flow (cf) 38401
	Sig/Spec str. 3/16
	Time downloaded /2:50
Pre - Storm V	
INLET	OUTLET
Battery (V)	Battery (V)
Clean bottle (Y/N)?	Clean bottle (Y/N)?
Pump tubing ok (Y/N)? Replaced?	Pump tubing ok (YAN)? Replaced?
Sampler tubing ok (Y/N)?	Sampler tubing ok (Y/N)?
Strainer ok?	Strainer ok?
Ext. desiccant ok (Y/N)? Changed?	Ext. desiccant ok (Y/N)? Changed?
Int. desiccant ok (Y/N)? Changed?	Int. desiccant ok (Y/N)? Changed?
Measure Dn level? Ok?	Measure Dn level? Ok?
Sample Volume (ml)	Enable level (ft)
Inspect Rain Gage	Pacing (cf) / Sample Volume (ml)
Sampler enabled? (Y/N)	Sampler enabled? (Y/N)
Post - Storm	
INLET	<u>OUTLE'I</u>
Equipment Ran Completely?	Equipment Ran Completely?
Sampler Enabled (date/time)?	Sampler Enabled (date/time)? 14.50 1/2
Composite Began (date/time)? 14:49 1/	Composite Began (date/time)? 14:50 1/6
Number of subsamples taken? $\frac{50}{50}$	Number of subsamples taken? 50/50
Any subsample collection errors?	Any subsample collection errors?
Last Sample (date/time)? 07:52 1/7	Last Sample (date/time)? 07:53 1/7
Est. Sample Volume Collected (mi) Sample ID? 11 1 Vol 010702 - IN	Est. Sample Volume Collected (ml) 7.5L
Sample ID? <u>VoA - 01070</u> 2-TW	Sample ID? \(\frac{\sqrt{0} \cdot \sqrt{0} \cdot \sqrt{0} \cdot \
Y/N Value Storm	1 Validation Criteria
Y > 5 hrs. (if known) Was there an antecedent de	
γ θ.99 in. Was total rainfall greater t	
Y 124 hrs. Was runoff duration greate	
	posite Sample Validation Criteria
Y 85 % % (approx.) Was greater than 75% of the	
/ 50 # subsample Were at least 10 sub-sample	
# subsample Were at least 10 sub-sample	les collected at the outlet?
Was a field duplicate collected? If so, Sample ID.	Field blank collected? If so, Sample ID.
NOTES (including any problems with equipment or maintenance	activities performed).
NOTES (including any problems with equipment or maintenance	rain fed. Lett battery to confinue to
Touter Association record rain	
Taylor Associates	

STORM EVENT NUMBER 9

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SR 405 Vortechnics



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CASE NARRATIVE for B2A0506

Client: Taylor Associates

Project Manager: James Packman Project Name: SR405 Vortechs Project Number: Not Provided

1.0 DESCRIPTION OF CASE

Four water samples were submitted for the analysis of Total and Dissolved Metals by EPA 200.8 and conventional chemistry parameters by APHA/EPA Methods.

2.0 COMMENTS ON SAMPLE RECEIPT

The samples were received and logged in on 25th January 2002 at a temperature of 9.6 Degrees Celsius.

3.0 Preparation and Analysis

Total and Dissolved Metals by EPA 200.8

All criteria for acceptable QC measurements were met with the following exceptions:

An aliquot of unpreserved sample was filtered and preserved in the lab in accordance with EPA 3005 for the analysis of dissolved metals.

Conventional Chemistry Parameters by APHA/EPA Methods

All criteria for acceptable QC measurements were met with the following exceptions:

- An aliquot of unpreserved sample was preserved with Sulfuric Acid in the lab for the analysis of Phosphorous by EPA 365.5.
- The percent recovery for the Phosphorous Matrix Spike in analytical batch 2B01025 was outside the established control limits of 57-137%; since all other QC recoveries were within control no further action was deemed necessary.

"I certify that this data package is in compliance with the Contract both technically and for completeness." for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature."

Amar Gill Project Manager

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/06/02 11:22

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
VOR-012502-IN	B2A0506-01	Water	01/25/02 07:23	01/25/02 09:45
VOR-012502-IN-DUP	B2A0506-02	Water	01/25/02 07:23	01/25/02 09:45
VOR-012502-OUT	B2A0506-03	Water	01/25/02 07:24	01/25/02 09:45
VOR-012502-OUT-DUP	B2A0506-04	Water	01/25/02 07:24	01/25/02 09:45

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/06/02 11:22

Total Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VOR-012502-IN (B2A0506-01) Water	Sampled: 0	1/25/02 07:23	Receive	d: 01/25/ 0 2	09:45			·	
Zinc	0.0972	0.0100	mg/l	1	2A28015	01/28/02	01/29/02	EPA 200.8	
VOR-012502-IN-DUP (B2A0506-02) W	ater Sampl	ed: 01/25/02 (07:23 Re	ceived: 01/	25/02 09:4	5			
Zinc	0.0800	0.0100	mg/l	ì	2A28015	01/28/02	01/29/02	EPA 200.8	
VOR-012502-OUT (B2A0506-03) Wate	r Sampled:	01/25/02 07:2	24 Recei	ved: 01/25/	02 09:45				
Zinc	0.0766	0.0100	mg/l	1	2A28015	01/28/02	01/29/02	EPA 200.8	
VOR-012502-OUT-DUP (B2A0506-04)	Water San	ipłed: 01/25/0	2 07:24	Received: 0	1/25/02 09	9:45			
Zinc	0.0790	0.0100	mg/l	1	2A28015	01/28/02	01/29/02	EPA 200.8	

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 02/06/02 11:22

Dissolved Metals by EPA 200 Series Methods North Creek Analytical - Bothell

		Reporting					-		
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VOR-012502-IN (B2A0506-01) Water	Sampled: 01	/25/02 07:23	Receive	d: 01/25/02	09:45				
Zinc	0.0156	0.010.0	mg/l	1	2B01013	02/01/02	02/01/02	EPA 200.8	
VOR-012502-IN-DUP (B2A0506-02) W	ater Sample	d: 01/25/02 ()7:23 Re	ceived: 01/2	25/02 09:4	5			
Zinc	0.0176	0.0100	mg/l	l	2B01013	02/01/02	02/01/02	EPA 200.8	
VOR-012502-OUT (B2A0506-03) Wate	г Sampled:	01/25/02 07:2	24 Recei	ved: 01/25/6	02 09:45	_			
Zine	0.0144	0.0100	mg/l	1	2B010[3	02/01/02	02/01/02	EPA 200.8	
VOR-012502-OUT-DUP (B2A0506-04)	Water Sam	pled: 01/25/0	2 07:24	Received: 0	1/25/02 09	9:45			
Zinc	0.0136	0.0100	mg/J]	2B01013	02/01/02	02/01/02	EPA 200.8	

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 02/06/02 11:22

Conventional Chemistry Parameters by APHA/EPA Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VOR-012502-IN (B2A0506-01) Water	Sampled: 01	L/25/02 07:23	Received:	01/25/02	09:45				<u>-</u>
Hardness	31.1		g eq. CaCO3/L		2B01022	02/01/02	02/06/02	SM 2340B	
Orthophosphate-phosphorus	0.0138	0.00200	mg/l		2A26004	01/25/02	01/25/02	EPA 365.2	
Phosphorus	0.0698	0.00500	n	u	2B01025	01/31/02	01/31/02	н	
Нq	6.89		pH Units	п	2A28017	01/25/02	01/25/02	EPA 150.1	
Total Suspended Solids	190	4.0	mg/l		2A30015	01/28/02	01/30/02	EPA 160.2	
Γurbidity	53.9	1.00	NTU	н	2A28016	01/25/02	01/25/02	EPA 180.1	
VOR-012502-IN-DUP (B2A0506-02) W	ater Sampl	ed: 01/25/02	07:23 Rece	ived: 01/:	25/02 09:4	5			
Hardness	26.6	1.00 mg	g eq. CaCO3/L	1	2B01022	02/01/02	02/06/02	SM 2340B	
Orthophosphate-phosphorus	0.0130	0.00200	mg/l	"	2A26004	01/25/02	01/25/02	EPA 365.2	
Phosphorus	0.200	0.00500	11	n	2B01025	01/31/02	01/31/02	•	
Нç	6.95		pH Units	π	2A28017	01/25/02	01/25/02	EPA 150.1	
Total Suspended Solids	130	4.0	mg/l	**	2A30015	01/28/02	01/30/02	EPA 160.2	
bidity	58.0	1.00	NTU	n	2A28016	01/25/02	01/25/02	EPA 180.1	
VOR-012502-OUT (B2A0506-03) Water	r Sampled:	01/25/02 07:	24 Received	d: 01/25/0	02 09:45				
Hardness	26.0	1.00 mg	g eq. CaCO3/L	1	2B01022	02/01/02	02/06/02	SM 2340B	
Orthophosphate-phosphorus	0.0112	0.00200	mg/l		2A26004	01/25/02	01/25/02	EPA 365.2	
Phosphorus	0.180	0.00500	n		2B01025	01/31/02	01/31/02	u	
ρH	6.99		pH Units	и	2A28017	01/25/02	01/25/02	EPA 150.1	
Total Suspended Solids	150	4.0	mg/I	и	2A30015	01/28/02	01/30/02	EPA 160.2	
Turbidity	56.0	1.00	NTU	n	2A28016	01/25/02	01/25/02	EPA 180.1	
VOR-012502-OUT-DUP (B2A0506-04)	Water Sam	płed: 01/25/0	02 07:24 Re	ceived: 0	1/25/02 09	9:45			
Hardness	26.6	1.00 mg	g eq. CaCO3/L	I	2B01022	02/01/02	02/06/02	SM 2340B	
Orthophosphate-phosphorus	0.0117	0.00200	mg/l	n	2A26004	01/25/02	01/25/02	EPA 365.2	
Phosphorus	0.191	0.00500	It	,,	2B01025	01/31/02	01/31/02	n	
рH	6.95		pH Units		2A28017	01/25/02	01/25/02	EPA 150.1	
Total Suspended Solids	140	4.0	mg/l	ı.	2A30015	01/28/02	01/30/02	EPA 160.2	
Turbidity	45.8	1.00	NTU	н	2A28016	01/25/02	01/25/02	EPA 180.1	

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/06/02 11:22

Total Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

		Reporting			Source	"	%REC	RPD		
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A28015: Prepared 01/28/02	Using E	PA 200 Sei	ries							•
Blank (2A28015-BLK1)										
Zine	ND	0.0100	mg/l							
LCS (2A28015-BS1)										
Zine	0.208	0.0100	mg/l	0.200		104	85-115			
LCS Dup (2A28015-BSD1)										
Zinc	0.190	0.0100	mg/l	0.200		95.0	85-115	9.05	15	
Duplicate (2A28015-DUP1)					Source: I	B2A0453-	03			
Zinc	ND	0.0100	mg/l		ND		<u>-</u>	2.48	20	
Matrix Spike (2A28015-MSI)					Source: I	B2A0453-	03			
Zinc	0.189	0.0100	mg/l	0.200	ND	93.1	75-125			

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/06/02 11:22

Dissolved Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

<u> </u>			Reporting					%REC		RPD		
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes	
Jatch 2B01013:	Prepared 02/01/02	Using E	PA 3005A									
Blank (2B01013-BL	.K1)					•						
line		ND	0.0100	mg/l								
LCS (2B01013-BS1)											
Zinc		0.200	0.0100	mg/I	0.200		100	85-115				
_CS Dup (2B01013	-BSD1)											
Zinc		0.199	0.0100	mg/l	0.200		99.5	85-115	0.501	15		
Suplicate (2B01013	-DUP1)					Source: E	32A0453-	03				
∠inc		ND	0.0100	mg/l		ND			9.51	20	•	
√atrix Spike (2B01	013-MS1)					Source: E	32A0453-	03				
inc	<u>-</u> .	0.210	0.0100	mg/i	0.200	ND	101	75-125				
ix Spike Dup (2B01013-MSD1)					Source: E	32A0453-	03				
inc		0.206	0.0100	mg/l	0.200	ND	99.0	75-125	1.92	20		

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/06/02 11:22

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A26004:	Prepared 01/25/02	Using G	eneral Pre	paration			·	•			
Blank (2A26004-BI	.K1)										
Orthophosphate-phosp	horus	ND	0.00200	mg/l				-			
LCS (2A26004-BSI)										
Orthophosphate-phosp	horus	0.146	0.00200	mg/l	0.150		97.3	90-110			
LCS Dup (2A26004	i-BSD1)										
Orthophosphate-phosp	horus	0.148	0.00200	mg/l	0.150		98.7	90-110	1.36	20	
Matrix Spike (2A26	5004-MS1)					Source: B	2A0506-	01			
Orthophosphate-phosp	horus	0.0593	0.00200	mg/i	0.0500	0.0138	91.0,	80-120			
Matrix Spike Dup (2A26004-MSD1)					Source: B	2A0506-	01			
Orthophosphate-phosp	horus	0.0622	0.00200	mg/l	0.0500	0.0138	96.8	80-120	4.77	25	
h 2A28016:	Prepared 01/25/02	Using G	eneral Pre	paration							
Blank (2A28016-BI	.K1)								·		,
Turbidity		ND	1.00	NTU							
LCS (2A28016-BS1)										
Turbidity		18.8	1.00	NTU	20.0		94.0	90-110			
LCS Dup (2A28016	-BSD1)										
Turbidity		18.9	1.00	NTU	20.0		94.5	90~110	0.531	20	
Duplicate (2A28016	i-DUP1)			•		Source: B	2A0506-	01			
Turbidity		48.3	1.00	NTU		53.9			11.0	20	

North Creek Analytical - Bothell

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amar Gill, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network** Page 7 of 10



11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 11720 North Creek Pkwy N, Suite 400, Bothell, WA 99011-82 425.420.9200 fax 425.420.9210 East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 02/06/02 11:22

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2A28017:	Prepared 01/25/02	Using G	eneral Pro	eparation							
Duplicate (2A28017	7-DUP1)					Source: I	32A0506-	D1			
Hc	· · · · · · · · · · · · · · · · · · ·	6.93		pH Units		6.89			0.579	10	
Batch 2A30015:	Prepared 01/28/02	Using G	eneral Pro	eparation		•					
Blank (2A30015-BI	LK1)										
Total Suspended Solid	5	ND	4.0	mg/l							
Duplicate (2A30015	S-DUP1)		Limit Units Units			Source: I	32A0506-	D1			
Total Suspended Solid	S	180	4.0	mg/l		190			5.4	19	
Batch 2B01022:	Prepared 02/01/02	Using EI	A 3010A								
Blank (2B01022-BI	.K1)										
Hardness	•	ND	1.00m	ig eq. CaCO3/	L						
_ (2B01022-BS1)										
Hardness		63.0	1.00m	ig eq. CaCO3/	L			70-130			
LCS Dup (2B01022	-BSD1)										
Hardness		62.6	1.00m	g eq. CaCO3/	L	·		70-130	0.637	20	
Matrix Spike (2B01	022-MS1)					Source: E	32A0506-	01			
Hardness		96.9	1.00m	g eq. CaCO3/	L	31.1		75-125			
Matrix Spike Dup (2B01022-MSD1)					Source: I	32A0506-	01			
Hardness	<u> </u>	97.3	1.00m	g eq. CaCO3/	L	31.1		75-125	0.412	20	

North Creek Analytical - Bothell

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North Creek Analytical, Inc. **Environmental Laboratory Network** Page 8 of 10



 Seattle
 11720 North Creek Pkwry N, Suite 400, Bothell, WA 98011-8244

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/06/02 11:22

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

		Reporting		Spike	Source	· · · · · · ·	%RÉC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Prepared 01/31/02	Using G	eneral Pre	paration							
LK1)	•									
	ND	0.00500	mg/l							•
)										
	0.152	0.00500	mg/l	0.150		101	90-120			
S-BSD1)										
	0.149	0.00500	mg/l	0.150		99.3	90-120	1.99	20	
1025-MS1)					Source: B	2A0506-	01			
	0.113	0.00500	mg/l	0.0250	0.0698	173	57-137			Q-0
(2B01025-MSD1)					Source: B	2A0506-	01			
••	0.104	0.00500	mg/i	0.0250	0.0698	137	57-137	8.29	25	
	Prepared 01/31/02 LK1) 5-BSD1) 1025-MS1) (2B01025-MSD1)	Prepared 01/31/02 Using G LK1) ND 0.152 5-BSD1) 0.149 1025-MS1) 0.113	Result Limit Prepared 01/31/02 Using General Present LK1) ND 0.00500 0.152 0.00500 3-BSD1) 0.149 0.00500 1025-MS1) 0.113 0.00500 (2B01025-MSD1)	Result Limit Units	Result Limit Units Level	Result Limit Units Level Result	Result Limit Units Level Result %REC	Result Limit Units Level Result %REC Limits	Result Limit Units Level Result %REC Limits RPD	Result Limit Units Level Result %REC Limits RPD Limit

North Creek Analytical - Bothell

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Amar Gill, Project Manager

North Creek Analytical, Inc. Environmental Laboratory Network Page 9 of 10



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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager. James Packman

Reported: 02/06/02 11:22

Notes and Definitions

The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the Q-01 recovery for this analyte does not represent an out-of-control condition for the batch.

Analyte DETECTED DET

Analyte NOT DETECTED at or above the reporting limit ND

NR Not Reported

Sample results reported on a dry weight basis dry

RPD Relative Percent Difference

North Creek Analytical - Bothell

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Amar Gill, Project Manager

North Creek Analytical, Inc. Environmental Laboratory Network Page 10 of 10

				3	CHAIN OF CUSTODY RECOR	CU		텕	묎	Ö	립				١			
Sample Collection by: TAVI OR ASSOCIATES	Client:												7					
Contact: James Packman Tel: 206.781 1487	Contact: Jay Cammermeyer Tel: 206.440.5070	Cammerme 1 5070	yer							-	Page: Project ID:		× _	소 () ()		Nortect's		
		,								a ·	ase Fi		,					
Laboratory: North Creek Analytical	alytical	Q,	Universit	y of W	University of Washington					ate re	Date recorded by:	i by:						
Contact: Amar Gill Tel: 425 420 9232			Contract: David Stenser	20 275 DAM	ed Signal		7				A 70 t	Z.	Analysis Required					
I VIA TANTITAVI SANTA	1		101. 200.	440.70	Ċ											ヿ		
SR405 Vortechs TM Monitoring Project	ortechs	Mo MI	nitori	ng I	roiec	→				·					*************************************			
				(,			lity	ess	Zn	ved Zn		-P		4	7		
Sample ID	Date Collected	Time Collected	Comp?	Grab?	# of contain.	matrix	TSS	Turbio	Hardn	Total	Dissol	TP	Ortho	PSD	Other'	Other'		Notes
?	1/25/02	62:25	Y	1	3	77	X	4	٦	Y	۲	≯	۲		X		Н	
2015211- MATOR 2012 10-101	1125/02	82:40	<	2	W	3	*	Ą	k	>	<u> </u>	<u>بر</u>	+		×		┝	
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NOV-04205-04-801	1/25/02	47.40 20154	*	k	~	W	K	٢	\	<u>*</u>	<u> </u>	1	×		k	\dagger	+	
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Comments/Special Notes:			Relinquished by	hed by	_					Relin	Relinquished by:	d by:						
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			Datc/Time	_	125/02	<i>140</i> 0	Z			Date/Time	Time							

Particle Size Distribution Analysis Results

Report Prepared for. Ingrid Weltz Taylor Associates Tel: 206.633.4486 Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact: Dr. David Stensel Tel: 206.543.9358

◆F::7:2

Project ID:

SR 405 Vortechs

Sample ID:

VOR-012502-IN-PSD

Date and Time Collected:

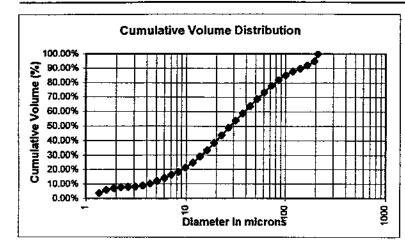
1/25/02

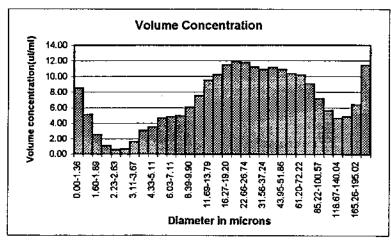
7:23

Date and Time of PSD Analysis:

1/26/02

14:04





	yours:	**********	Mass
Range	Concentration		
(AHCIONS)	(4/1)	96)	(mg)
0.00-1.36	8.53	3.82%	6.30
1.36-1.60	5.13	6.12%	3.79
1.60-1.89	2.51	7.24%	1.85
1.89-2.23	1.07	7.72%	0.79
2.23-2.63	0.56	7.97%	0.41
2.63-3.11	0.64	8.26%	0.48
3.11-3.67	1.59	8,97%	1.18
3.67-4,33	3.12	10.37%	2.30
4.33-5.11	3.51	11.94%	2.59
5.11-6.03	4.67	14.03%	3.45
6.03-7.11	4.82	16.19%	3.56
7.11-8.39	4.96	18.41%	3.66
8.39-9.90	6.03	21.11%	4.45
9.90-11.69	7.52	24.48%	5.55
11.69-13.79	9.49	28.73%	7.01
13.79-16.27	10.21	33.30%	7.54
16.27-19.20	11.48	38.44%	8.47
19.20-22.66	11.91	43.77%	8.79
22.66-26.74	11.79	49.05%	8.70
26.74-31.56	11.18	54.06%	8.26
31.56-37.24	10.88	58.93%	8.03
37.24-43.95	11.17	63.93%	8.25
43.95-51.86	10.85	68.79%	8.01
51.86-61.20	10.31	73,40%	7.61
61.20-72.22	10.16	77.95%	7.50
72.22-85.22	9.06	82.01%	6.69
85.22-100.57	7.17	85.22%	5.30
100.57-118.67	5.66	87.76%	4.18
118,67-140,04	4.65	89.84%	3.43
140.04-165.26	4.87	92.02%	3.59
165.26-195.02	6.40	94.89%	4.73
195.02-212	11.42	100.00%	8.43
Total	223.31		164.90

Computed Statistics:

Weight Mean = 54.17 microns

 $D_{10} = 3.67$ microns $D_{50} = 26.74$ microns $D_{80} = 140.04$ microns

Volume of Sample:

975 ml

Volume of Dilution:

1525 ml added

Comments:

1/0/00

Size Range	Mass of TSS	% Mass
(microns) < 212	(mg) 164.90	89.43%
212-425	7.50	4.07%
425-850	3.80	2.06%
>850	8.20	4.45%
Total	184.40	100.00%

Particle Size Distribution Analysis Results

Report Prepared for: Ingrid Weltz

Taylor Associates Tel: 206.633.4486 Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact: Dr. David Stensel Tel: 206.543.9358

Project ID:

SR 405 Vortechs

Sample ID:

VOR-012502-OUT-PSD

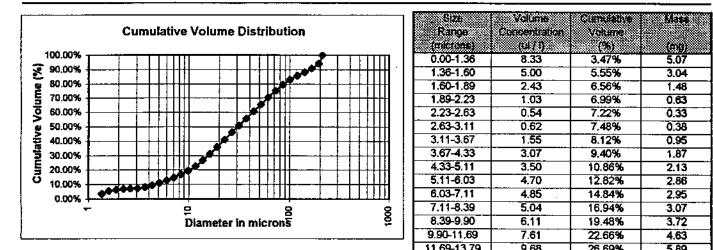
Date and Time Collected:

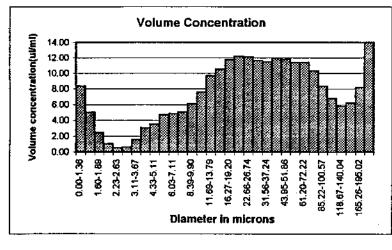
1/25/02

7:24

Date and Time of PSD Analysis:

1/26/02 14:41





Range	Concentration	Volume	
(microns)	(ul / 1)	(%)	(mg)
0.00-1.36	8.33	3.47%	5.07
1.36-1.60	5.00	5.55%	3.04
1.60-1.89	2.43	6.56%	1.48
1.89-2.23	1.03	6,99%	0.63
2.23-2.63	0.54	7.22%	0.33
2.63-3.11	0.62	7.48%	0.38
3.11-3.67	1.55	8.12%	0.95
3.67-4.33	3.07	9.40%	1.87
4.33-5.11	3.50	10.86%	2.13
5.11-6.03	4.70	12.82%	2.86
6.03-7,11	4.85	14.84%	2.95
7.11-8.39	5.04	16,94%	3.07
8.39-9.90	6,11	19.48%	3.72
9.90-11,69	7.61	22.66%	4.63
11,69-13,79	9.68	26,69%	5.89
13.79-16,27	10.53	31.07%	6.41
16.27-19.20	11.75	35.97%	7.15
19.20-22.66	12.20	41.05%	7.43
22.66-26.74	12.15	46.12%	7.40
26.74-31.56	11.66	50.97%	7.10
31.56-37.24	11.46	55.75%	6,98
37.24-43.95	11.99	60.75%	7.30
43.95-51.86	11.82	65.67%	7.19
51.86-61.20	11.41	70.42%	6.95
61.20-72.22	11.40	75.17%	6.94
72.22-85.22	10.32	79.47%	6.28
85.22-100.57	8.34	82.95%	5.07
100.57-118.67	6.79	85.78%	4,13
118.67-140.04	5.78	88,19%	3.52
140.04-165.26	6.21	90.77%	3,78
165.26-195.02	8.16	94,17%	4.97
195.02-212			
	13.98	100.00%	8.51

Computed Statistics:

Weight Mean = 58.66 microns

 $D_{10} =$ 4.33 microns 26.74 microns $D_{90} = 140.04 \text{ microns}$

Volume of Sample:

975 ml

Volume of Dilution:

1525 ml added

Comments: 1/0/00

Size Range	Mass of TSS	% Mass
(microns)	(mg)	185
< 212	146.10	96.56%
212-425	2.50	1.65%
425-850	2.00	1.32%
>850	0.70	0.46%
Total	151.30	100.00%

	SITE VISIT	Γ SHEET (SR 405 Vortechs [™] Monitoring)	
Date/Time	1123/02 12:00	Field Staff JA Weather Clandy light	occ. rain
	Pre-St	rom Visit or - Post-Storm Visit (circle one)	- -
	INLET	OUTLET	
Check Curr	ent Readings / Downloa	 	d.
ISCO	Time? reset (Y/N)?	And the second s	4.4
1300	Time downloaded		
		Level (ft.)	0.163
	level (ft.)	Velocity (f/s)	0.14*
		U.OZ6 Flow (cfs)	<u>₽</u> *
	,	Total Flow (cf)	98605
		Sig/Spec str.	9/1)
		Time downloaded	
	TATE INTO	Pre - Storm Visit	
D-4 0D	INLET	OUTLET	4
Battery (V)	ለፖለኪሳ	Battery (V)	-12.
Clean bottle		Clean bottle (Y/N)?	- '. Y
	ok (Y/N)? Replaced?	Pump tubing ok (Y/N)? Replaced?	Y-replace
-	ng ok (Y/N)?	Sampler tubing ok (Y/N)?	y rese
Strainer ok?	4 - I - GZB NO - GL 10	Strainer ok?	-
	t ok (Y/N)? Changed?	Ext. desiccant ok (Y/N)? Changed?	<u> </u>
	t ok (Y/N)? Changed?	Int. desiccant ok (Y/N)? Changed?	. y
Measure Dn		Measure Dn level? Ok?	· ·
Sample Volu		Enable level (ft)	10-55
Inspect Rain	_	Pacing (cf) / Sample Volume (ml) Sampler enabled? (Y/N)	100 1200m
Sampler enal	<u> </u>		
	INLET	Post - Storm Visit	
Equipment R	an Completely?	Equipment Ran Completely?	
Sampler Enal	bled (date/time)?	Sampler Enabled (date/time)?	
Composite Be	egan (date/time)?	Composite Bégan (date/time)?	
Number of su	ibsamples taken?	Number of subsamples taken?	
Any subsamp	ole collection errors?	Any subsample collection errors?	
Last Sample		Last Sample (date/time)?	
Est. Sample V	Volume Collected (ml); .	Est. Sample Volume Collected (ml)	
Sample ID?		Sample ID?	
Y/N	Value	Storm Validation Criteria	
		Was there an antecedent dry period of at least six hours?	
		Was total rainfall greater than or equal to 0.25"?	
L	hrs.	Was prinoff duration greater than one hour?	
Y/N	Value	Flow sweighted Composite Seconda Vielidation Colin	_
		Flow-weighted Composite Sample Validation Criteria Was greater than 75% of the total volume of the storm sampled?	
		Were at least 10 sub-samples collected at the inlet?	-
-		Were at least 10 sub-samples collected at the miet? Were at least 10 sub-samples collected at the outlet?	- .
	- # suosample	more at least to sub-samples confected at the office!	
Was a field di	unlicate collected? If so	Sample ID Field blank collected? If so, Sample II	,
a riviu ui		Tred ording confection in so, Sample II	/
NOTES (inclu	uding any problems with	equipment or maintenance activities performed):	

SITE VISIT SHEET (SR 405 VortechsTM Monitoring) Weather mist/14 rain Date/Time 1/25/02 07:30 Field Staff Pre-Strom Visit - or - Post-Storm Visit (circle one) OUTLET **INLET** Check Current Readings / Download: Check Current Readings / Download: ISCO Time? reset (Y/N)? Time? reset (Y/N)? ISCO Time downloaded Level (ft.) level (ft.) Velocity (f/s) 0.289 Flow (cfs) 36319 Total Flow (cf) Sig/Spec str. 79/88 Time downloaded 2.25 Pre - Storm Visit INLET OUTLET Battery (V) Battery (V) Clean bottle (Y/N)? Clean bottle (Y/N)? Pump tubing ok (Y/N)? Replaced? Pump tubing ok (Y/N)? Replaced? Sampler tubing ok (Y/N)? Sampler tubing ok (Y/N)? Strainer ok? Strainer ok? Ext. desiccant ok (Y/N)? Changed? Ext. desiccant ok (Y/N)? Changed? Int. desiccant ok (Y/N)? Changed? Int. desiccant ok (Y/N)? Changed? Measure Divlevel? Ok? Measure Dn level? Ok? Sample Volume (ml) Enable level (ft) Pacing (cf) / Sample Volume (ml) Inspect Rain Gage Sampler enabled? (Y/N) Sampler enabled? (Y/N) Post - Storm Visit OUTLET INLET Equipment Ran Completely? Equipment Ran Completely? Sampler Enabled (date/time)? Sampler Enabled (date/time)? 5 00:24 Composite Began (date/time)? Composite Began (date/time)? Number of subsamples taken? Number of subsamples taken? 50/s0 Any subsample collection errors? Any subsample collection errors? 1125 7:23 Last Sample (date/time)? Last Sample (date/time)? Est. Sample Volume Collected (ml) Est. Sample Volume Collected (ml) 100001 MR 27/2502-06 Sample ID? R-017502-511 Sample ID? Storm Validation Criteria Y/N Value hrs. (if known) Was there an antecedent dry period of at least six hours? Y in. Was total rainfall greater than or equal to 0.25"? Was runoff duration greater than one hour? Flow-weighted Composite Sample Validation Criteria Y/N Value Was greater than 75% of the total volume of the storm sampled? % (approx.) # subsample Were at least 10 sub-samples collected at the inlet? # subsample Were at least 10 sub-samples collected at the outlet? Was a field duplicate collected? If so, Sample ID. Field blank collected? If so, Sample ID. NOTES (including any problems with equipment or maintenance activities performed): - I niet seens a over complete tweek collibration

Taylor Associates

- submitted field duplicate

WAY STY

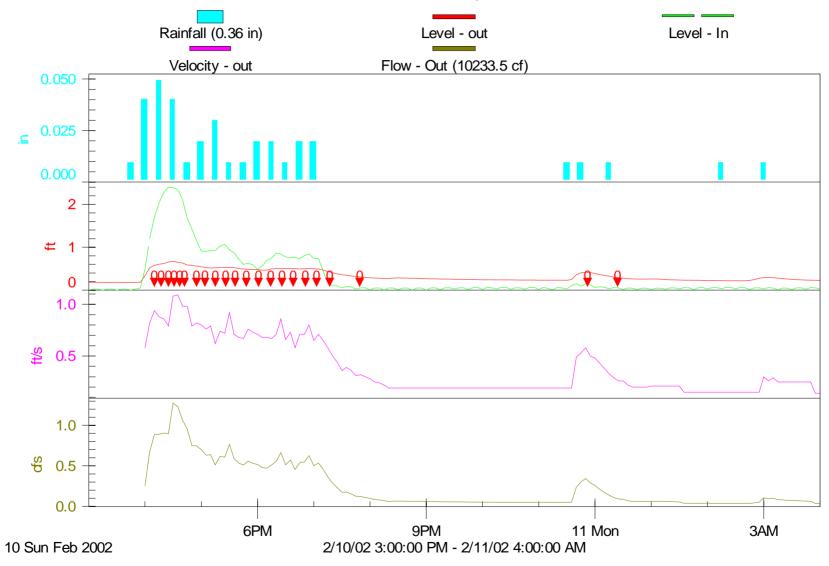
1/7/02

STORM EVENT NUMBER 10

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•		

SR 405 Vortechnics

Storm#10, 10-11 February 2002



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•		



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

CASE NARRATIVE for B2B0232

Client: Taylor Associates

Project Manager: James Packman Project Name: SR405 Vortechs Project Number: Not Provided

1.0 DESCRIPTION OF CASE

Two water samples were submitted for the analysis of Total and Dissolved Metals by EPA 200.8 and conventional chemistry parameters by APHA/EPA Methods.

2.0 COMMENTS ON SAMPLE RECEIPT

The samples were received and logged in on 11th February 2002 at a temperature of 7.5 Degrees Celsius.

3.0 Preparation and Analysis

Total and Dissolved Metals by EPA 200.8

All criteria for acceptable QC measurements were met with the following exceptions:

- The RPD for the Total Zinc duplicate in analytical batch 2B19005 was outside the established control limit of 20%, since all other QC criteria in the analytical batch were met no further action was deemed
- An aliquot of unpreserved sample was filtered and preserved in the lab in accordance with EPA 3005 for the analysis of dissolved metals.

Conventional Chemistry Parameters by APHA/EPA Methods

All criteria for acceptable QC measurements were met with the following exceptions:

An aliquot of unpreserved sample was preserved with Sulfuric Acid in the lab for the analysis of Phosphorous by EPA 365.5.

"I certify that this data package is in compliance with the Contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature."

Project Manager

North Creek Analytical



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503.906.9200 fax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, DR 97701-5711 541.383.9310 fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
VDR-021102-IN	B2B0232-01	Water	02/11/02 00:23	02/11/02 13:40
VDR-021102-OUT	B2B0232-02	Water	02/11/02 00:24	02/11/02 13:40

North Creek Analytical - Bothell

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

Total Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VDR-021102-IN (B2B0232-01) Water	Sampled: 02	/11/02 00:23	Received	i: 02/11/02	13:40				
Zinc	0.111	0.0100	mg/l	1	2B19005	02/19/02	02/19/02	EPA 200.8	
VDR-021102-OUT (B2B0232-02) Water	Sampled:	02/11/02 00:2	24 Receiv	ved: 02/11/0	2 13:40				
Zinc	0.122	0.0100	mg/l	1	2B19005	02/19/02	02/19/02	EPA 200.8	

North Creek Analytical - Bothell

Amar Gill, Project Manager

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

Dissolved Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VDR-021102-IN (B2B0232-01) Water	Sampled: 02	/11/02 00:23	Received	1: 02/11/02	13:40	***			Q-30
Zinc	0.0183	0.0100	mg/l	1	2B14028	02/14/02	02/15/02	EPA 200.8	
VDR-021102-OUT (B2B0232-02) Wate	r Sampled:	02/11/02 00:2	24 Receiv	ved: 02/11/0	2 13:40				Q-30
Zinc	0.0210	0.0100	mg/l	1	2B14028	02/14/02	02/15/02	EPA 200.8	

Sorth Creek Analytical - Bothell

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Amar Gill, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network** Page 3 of 10



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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

Conventional Chemistry Parameters by APHA/EPA Methods North Creek Analytical - Bothell

		Reporting	•						
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VDR-021102-IN (B2B0232-01) Water	Sampled: 02	2/11/02 00:23	Received:	02/11/02	13:40				
Hardness	27.2	1.00 mg	eq. CaCO3/L	.]	2B15009	02/15/02	02/18/02	SM 2340B	
Orthophosphate-phosphorus	0.0171	0.00200	mg/l	n	2B12044	02/12/02	02/12/02	EPA 365.2	
Phosphorus	0.214	0.00500	п		2B19029	02/18/02	02/19/02		
рН	7.06		pH Units		2B12001	02/11/02	02/11/02	EPA 150.1	
Total Suspended Solids	110	4.0	mg/l	"	2B18024	02/12/02	02/18/02	EPA 160.2	
Turbidity	39.4	1.00	NTU	**	2B12003	02/11/02	02/11/02	EPA 180.1	
VDR-021102-OUT (B2B0232-02) Water	Sampled:	02/11/02 00:	24 Received	i: 02/11/0	2 13:40				
Hardness	29.1	gm 00.1	eq. CaCO3/L	ì	2B15009	02/15/02	02/18/02	SM 2340B	
Orthophosphate-phosphorus	0.00773	0.00200	mg/l		2B12044	02/12/02	02/12/02	EPA 365.2	
Phosphorus	0.257	0.00500	**	"	2B19029	02/18/02	02/19/02	P	
pН	7.02		pH Units	**	2B12001	02/11/02	02/11/02	EPA 150.1	
Total Suspended Solids	130	4.0	mg/l	#1	2B18024	02/12/02	02/18/02	EPA 160.2	
rbidity	48.0	1.00	NTU	•	2B12003	02/11/02	02/11/02	EPA 180.1	

North Creek Analytical - Bothell

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

Total Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2B19005: Prepared 02/19/02	Using El	PA 200 Ser	ies					<u>-</u>		
Blank (2B19005-BLK1)								. —		
Zinc	ND	0.0100	mg/l							
LCS (2B19005-BS1)										
Zinc	0.199	0.0100	mg/l	0.200		99.5	85-115		KIP	
LCS Dup (2B19005-BSD1)										
Zine	0.197	0.0100	mg/l	0.200		98.5	85-115	1.01	15	
Duplicate (2B19005-DUP1)					Source: E	32B0276-	01			
Zinc	0.0352	0.0100	mg/l		0.0470			28.7	20	Q-(
Matrix Spike (2B19005-MS1)					Source: E	32B0276-	D1			
Zinc	0.227	0.0100	mg/l	0.200	0.0470	90.0	75-125		W. V.	

North Creek Analytical - Bothell

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

Dissolved Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2B14028: Prepared 02/14/	02 Using F	PA 3005A					•			
Blank (2B14028-BLK1)					_					
Zinc	ND	0.0100	mg/l					· · · · · · · · · · · · · · · · · · ·		
LCS (2B14028-BS1)										
Zinc	0.209	0.0100	mg/l	0.200		104	85-115			
LCS Dup (2B14028-BSD1)										
Zinc	0.208	0.0100	mg/l	0.200		104	85-115	0.480	15	
Duplicate (2B14028-DUPI)					Source: E	2B0232-	01			
Zine	0.0181	0.0100	mg/l		0.0183			1.10	20	
Matrix Spike (2B14028-MS1)					Source: B	2B0194-	01			
Zinc	0.213	0.0100	mg/l	0.200	ND	104	75-125			

North Creek Analytical - Bothell

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2B12001:	Prepared 02/11/02	Using G	eneral Pre	paration							
Duplicate (2B1200)	I-DUPI)				···	Source: E	32B0232-	02	•••		
pН		7.01		pH Units		7.02			0.143	10	
Batch 2B12003:	Prepared 02/11/02	Using G	eneral Pre	paration							
Blank (2B12003-BI	-K1)	·		•							
Turbidity		ND	1.00	NTU							
LCS (2B12003-BS1)										
Turbidity		19.8	1.00	NTU	20.0		99.0	90-110			
LCS Dup (2B12003	-BSD1)										
Turbidity		19.8	1.00	NTU	20.0		99.0	90-110	0.00	20	
Duplicate (2B12003	J-DUP1)					Source: B	2B0231-0	01			
vidity		12.6	1.00	NTU		12.2			3.23	20	
Batch 2B12044:	Prepared 02/12/02	Using G	eneral Pre	paration							
Blank (2B12044-BI	.K1)										
Orthophosphate-phospi	horus	ND	0.00200	mg/l							
LCS (2B12044-BS1)										
Orthophosphate-phosp	horus	0.0917	0.00200	mg/l	0.0999		91.8	90-110	·································		
LCS Dup (2B12044	-BSD1)										
Orthophosphate-phospi	horus	0.0939	0.00200	mg/l	0.0999		94.0	90-110	2.37	20	

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North Creek Analytical, Inc. **Environmental Laboratory Network** Page 7 of 10



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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2B12044:	Prepared 02/12/02	Using G	eneral Pre	paration	•						
Matrix Spike (2B12	2044-MS1)					Source: I	32B0232-	01			
Orthophosphate-phosp	horus	0.109	0.00200	mg/i	0.0999	0.0171	92.0	80-120	·	•	
Matrix Spike Dup ((2B12044-MSD1)					Source: E	32B0232-	01			
Orthophosphate-phosp	horus	0.108	0.00200	mg/l	0.0999	0.0171	91.0	80-120	0.922	25	
Batch 2B15009:	Prepared 02/15/02	Using E	PA 3020A								
Blank (2B15009-BI	LK1)				• • •						
Hardness		ND	1.00 աչ	g eq. CaCO3/L							
LCS (2B15009-BS1)										
Hardness		60.0	1.00mg	eq. CaCO3/L				70-130			
LCS Dup (2B15009	-BSD1)										
iness		61.0	1.00mg	g eq. CaCO3/L				70-130	1.65	20	
Matrix Spike (2B15	5009-MS1)					Source: E	2B0232-0)1			
Hardness	· · · · · · · · · · · · · · · · · · ·	89.6	1.00mg	eq. CaCO3/L		27.2		75-125			
Matrix Spike Dup ((2B15009-MSD1)					Source: B	2B0232-0)1			
Hardness		90.9	1.00mg	eg. CaCO3/L		27.2		75-125	1.44	20	
Batch 2B18024:	Prepared 02/12/02	Using G	eneral Prej	paration							
Biank (2B18024-BI	.K1)										
Total Suspended Solid		ND	4.0	mg/l							

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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2B18024:	Prepared 02/12/02	Using G	eneral Pre	paration			•				
Duplicate (2B18024	4-DUP1)					Source: I	32B0232-	01			
Total Suspended Solid	s	120	4.0	mg/l		110	· · · · · · · · · · · · · · · · · · ·		8.7	19	
Batch 2B19029:	Prepared 02/18/02	Using G	eneral Pre	paration							
Blank (2B19029-BI	L K1)										
Phosphorus		ND	0.00500	mg/l					-		
LCS (2B19029-BS1	1)										
Phosphorus		0.149	0.00500	mg/l	0.150		99.3	90-120			
LCS Dup (2B19029	P-BSD1)										
Phosphorus		0.149	0.00500	mg/l	0.150		99.3	90-120	0.00	20	
Matrix Spike (2B19	9029-MS1)					Source: F	2B0240-	01			
sphorus		0.126	0.00500	mg/l	0.0499	0.0759	100	57-137			
Matrix Spike Dup ((2B19029-MSD1)					Source: E	2B0240-	01			
Phosphorus		0.125	0.00500	mg/l	0.0499	0.0759	98.4	57-137	0.797	25	

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Amar Gill, Project Manager

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 02/25/02 15:41

Notes and Definitions

Q-01	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the
	management from their analysis of any material and any section of the section of

recovery for this analyte does not represent an out-of-control condition for the batch.

This sample was laboratory filtered since it was not field filtered as is required by the methodology. Q-30

DEŢ Analyte DETECTED

Analyte NOT DETECTED at or above the reporting limit ND

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

North Creek Analytical - Bothell

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Amar Gill, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network** Page 10 of 10

Comments/Special Notes: Contact: James Packman Tel: 425.420.9232 Contact: Amar Gill Tel: 206.78]_1487-TAYLOR ASSOCIATES Sample Collection by: Caboratory: North Creek Analytical 10R-021102-5N VOR-021102- DUZ SR405 Vortechs TM Monitoring Project Contact: Jay Cammermeyer WSDOT Client: 101-206-440.5070 2/m/D2 411/102 Collected Collected Comp? Grab? contain. 72:00 00:23 Time 乌 Company
Date/Time Signature Printed Name Received by: 87) my Signature Relinquished by: Tel: 206.543.9358 Contact: David Stensel University of Washington Date/Time Company Printed Name CHAIN OF CUSTODY RECORD Tayley 15500 2/11/02 RANV # of matrix દ Ź TSS Turbidity Hardness Date recorded by: Company Date/Time Relinquished by:
Signature
Printed Name Date/Time Сотрилу Signature Printed Name Received by: Total Zn Page: Project ID: Case File #: Dissolved Zn Analysis Required TP Ortho-P PSD Other? ρH ζ Other? 9 Notes

6280237

Taylor Associates 1/7/02

7500

Appendix B- field sheets.xds, CoC - 8R405

Particle Size Distribution Analysis Results

Report Prepared for: Ingrid Weltz Taylor Associates

Tel: 206.633.4486

Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact: Dr. David Stensel Tel: 206.543.9358

Project ID:

SR405 Vortechs

Sample ID:

VOR-021102-IN-PSD

Date and Time Collected:

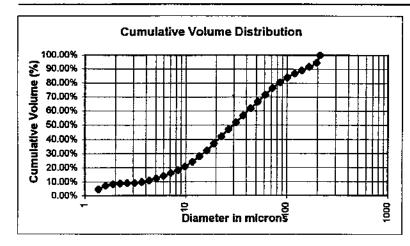
2/11/02

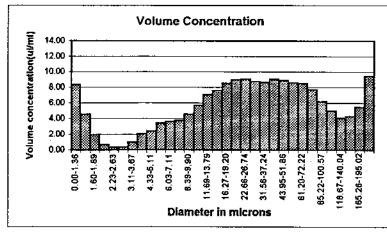
0:23

Date and Time of PSD Analysis:

2/12/02

13:48





Size	Volume	Curminina	
Range	Concentration	Volume	
(microns)	(4/7)	(%)	(00)
0.00-1.36	8.32	4.66%	5.23
1.36-1.60	4.56	7.22%	2.87
1.60-1.89	1.96	8.32%	1.23
1.89-2.23	0.72	8.72%	0.45
2.23-2.63	0.33	8.91%	0.21
2.63-3.11	0.37	9.11%	0.23
3.11-3.67	0.99	9.67%	0.62
3.67-4.33	2.09	10.84%	1.31
4.33-5.11	2.40	12.19%	1.51
5.11-6.03	3.42	14.10%	2.15
6.03-7.11	3.61	16.12%	2.27
7.11-8.39	3.75	18.22%	2.36
8.39-9.90	4.54	20.77%	2.85
9.90-11.69	5.65	23.94%	3.55
11.69-13.79	7.09	27.91%	4.46
13.79-16.27	7.59	32.17%	4,77
16.27-19.20	8.50	36.93%	5.34
19.20-22.66	8.98	41.97%	5.64
22.66-26.74	9.03	47.03%	5.67
26.74-31.56	8.76	51.94%	5.51
31.56-37.24	8,63	56.77%	5.42
37.24-43.95	9.02	61.83%	5.67
43.95-51.86	8.89	66.82%	5.59
51.86-61.20	8.59	71.63%	5.40
61.20-72.22	8.49	76.39%	5.34
72.22-85.22	7.71	80.71%	4.85
85.22-100.57	6.18	84.17%	3.88
100.57-118.67	4.95	86.95%	3.11
118.67-140.04	4.08	89.24%	2.57
140.04-165.26	4.29	91.64%	2.69
165.26-195.02	5.46	94.70%	3.43
195.02-212	9.45	100.00%	5.94
Total	178.39		112.10

Computed Statistics:

Weight Mean = 56.33 microns

 $D_{10} = 3.67$ microns $D_{50} = 26.74$ microns $D_{80} = 140.04$ microns

Volume of Sample:

1000 ml

Volume of Dilution:

Comments: 1/0/00

1000 ml added

Size Range	Mass of TSS	% Wass
(mkrons) < 212	(mg) 112.10	90.99%
212-425	7.50	6.09%
425-850	2.20	1.79%
>850	1.40	1.14%
Total	123.20	100.00%

Particle Size Distribution Analysis Results

Report Prepared for: Ingrid Weltz Taylor Associates Tel: 206.633,4486 Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact: Dr. David Stensel Tel: 206.543.9358

Project ID:

SR405 Vortechs

Sample ID:

VOR-021102-OUT-PSD

Date and Time Collected:

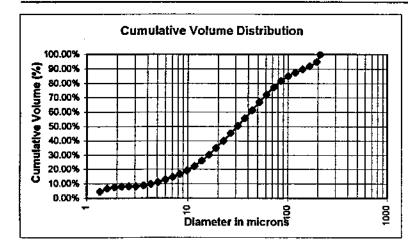
2/11/02

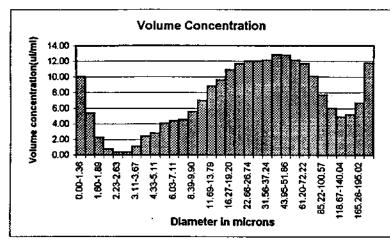
0:24

Date and Time of PSD Analysis:

2/12/02

14:50





984	A CHAILING	OTHURING.	846.50
Range	Concentration	Volume	
(macrons)	(1471)	(%)	S (mg)
0.00-1.36	10.03	4.36%	5.53
1.36-1.60	5.38	6.70%	2.97
1.60-1.89	2.25	7.67%	1.24
1.89-2.23	0.79	8.02%	0.44
2.23-2.63	0.35	8.17%	0.19
2.63-3.11	0.39	8.34%	0.22
3.11-3.67	1.10	8.82%	0.61
3.67-4.33	2.41	9.86%	1.33
4.33-5.11	2.82	11.09%	1.56
5.11-6.03	4.08	12.86%	2.25
6.03-7.11	4.41	14.78%	2.43
7.11-8.39	4.60	16.78%	2.54
8.39-9.90	5.59	19.21%	3.08
9.90-11.69	6.96	22.23%	3.84
11.69-13.79	8.85	26.08%	4.88
13.79-16.27	9.56	30.23%	5.28
16.27-19.20	10.90	34,97%	6.01
19.20-22.66	11.68	40.04%	6.45
22.66-26.74	12.04	45.27%	6.64
26.74-31.56	12.01	50.49%	6.63
31.56-37.24	12.14	55.76%	6.70
37.24-43.95	12.86	61.35%	7.10
43.95-51.86	12.76	66.89%	7.04
51.86-61.20	12.15	72.17%	6.70
61.20-72.22	11,69	77.25%	6.45
72.22-85.22	10.09	81.63%	5.57
85.22-100.57	7.68	84.97%	4.24
100.57-118.67	6.01	87.58%	3.32
118.67-140.04	4.92	89.72%	2.72
140.04-165.26	5.20	91.98%	2.87
165.26-195.02	6.67	94.88%	3.68
195.02-212	11.78	100.00%	6.50
Total	230.17		127.00

Computed Statistics:

Weight Mean = 56.12 microns

 $D_{10} = 4.33$ microns $D_{50} = 26.74$ microns $D_{90} = 140.04$ microns

Volume of Sample:

1025 ml

Volume of Dilution:

975 ml added

Comments:

1/0/00

Sizo Range	Mass of 155	% Mass
< 212	127.00	96.87%
212-425	2.40	1.83%
425-850	1.30	0.99%
>850	0.40	0.31%
Total	131.10	100.00%

SITE VISIT SHEET	(SR	405	Vortechs TM	Monitoring)
------------------	-----	-----	------------------------	-------------

Date/Time	218/02 12:15	Field Staff JA	Weather overces of x co	
	Pre-Str	rom Visit - or - Post-Storm	Visit (circle one)	٦,
	INLET		OUTLET	
Charle Cure	ent Readings / Downloa	.d.		1.
ISCO	Time? reset (Y/N)?		Check Current Readings / Download ISCO Time? reset (Y/N)?	1: 12:31 N
1500	Time downloaded	12:30 N	Level (ft.)	
		0-062	Velocity (f/s)	0.727 _0.73 *
	level.	0.000	Flow (cfs)	<u> </u>
			Total Flow (cf)	3643,0
			Sig/Spec str.	4/6
			Time downloaded	- Y / W
		Pre - Storm V		
	INLET	***	OUTLET	
Battery (V)		12.5	Battery (V)	12.5
Clean bottle		<u>Y</u>	Clean bottle (Y/N)?	- 7
	ok (Y/N)? Replaced?	<u> Y [N</u>	Pump tubing ok (Y/N)? Replaced?	$\sqrt{\chi/N}$
-	ng ok (Y/N)?	<u> </u>	Sampler tubing ok (Y/N)?	
Strainer ok?			Strainer ok?	
	t ok (Y/N)? Changed?	Y IN	Ext. desiccant ok (Y/N)? Changed?	Y. / N
	t ok (Y/N)? Changed?	<u> </u>	Int. desiccant ok (Y/N)? Changed?	YIN
Measure Dn			Measure Dn level? Ok?	9.15
Sample Volu	* *	200	Enable level (ft)	> 0.55 / Otese
Inspect Rain	_	<u> </u>	Pacing (cf) / Sample Volume (ml)	400/200
Sampler enal			Sampler enabled? (Y/N)	
Delay t	is steet 06:01 on s		right Delay to start open	Sa+2/9
	INLET !	sat 2 (9 Post - Storm V	OUTLET	sat 44
Equipment R	an Completely?		Equipment Ran Completely?	
Sampler Ena	bled (date/time)?		Sampler Enabled (date/time)?	
Composite B	egan (date/time)?		Composite Began (date/time)?	
Number of su	bsamples taken?		Number of subsamples taken?	
Any subsamp	ole collection errors?		Any subsample collection errors?	
Last Sample	(date/time)?		Last Sample (date/time)?	
	Volume Collected (ml)		Est. Sample Volume Collected (ml)	
Sample ID?			Sample ID?	
				_
Y/N	Value	Storm	Validation Criteria	
			y period of at least six hours?	
		Was total rainfall greater th		_
<u> </u>	hrs.	Was runoff duration greater	than one hour?	_
Y/N	Value	Flow weighted Com	posite Sample Validation Criteria	~
			e total volume of the storm sampled?	4
		Were at least 10 sub-sample		┥
		Were at least 10 sub-sample		┥
<u> </u>		at zame av buo-bumpic	- Annahira at the Attracti	_
Was a field di	uplicate collected? If so.	Sample ID.	Field blank collected? If so, Sample ID	1
. –	- /		manple ID	*
NOTES (incl	uding any problems with	equipment or maintenance	activities performed):	

SITE VISIT SHEET (SR 405 VortechsTM Monitoring)

Date/Time_2/11/	12 12 man	Field Staff TP	Weather E	<u>.</u>
,	Pre-St	rom Visit - or Post-Storn	a Visit (circle one)	
	INLET	The second section of the second	OUTLET	
Check Current Rea	dings / Downloa	d:	Check Current Readings / Download	:
ISCO Time?	reset (Y/N)?	12:18	ISCO Time? reset (Y/N)?	12:19/2
Time d	ownloaded	12:31	Level (ft.)	0.195
level (f	t.)	0.026	Velocity (f/s)	0.1H- *
			Flow (cfs)	₽ ·
			Total Flow (cf)	8922
			Sig/Spec str.	0/1
			Time downloaded	12:30
		Pre - Storm V		
`	INLET		<u>OUTLET</u>	
Battery (V)			Battery (V)	
Clean bottle (Y/N)?		<u> </u>	Clean bottle (Y/N)?	
Pump tubing ok (Y/N	I)? Replaced?		Pump tubing ok (Y/N)? Replaced?	
Sampler tubing ok (Y	7/N)?		Sampler tubing ok (Y/N)?	
Strainer ok?			Strainer ok?	
Ext. desiccant ok (Y/	N)? Changed?		Ext. desiccant ok (Y/N)? Changed?	
Int. desiccant ok (Y/I	V)? Changed?		Int. desiccant ok (Y/N)? Changed?	
Measure Dn level? O	k?		Measure Dn level? Ok?	
Sample Volume (ml)			Enable level (ft)	
Inspect Rain Gage	/	/	Pacing (cf) / Sample Volume (ml)	<u> </u>
Sampler enabled? (Ya	(N)	•	Sampler enabled? (Y/N)	
•			•	
		Post - Storm		
	INLET		OUTLET	
Equipment Ran Com		<u> </u>	Equipment Ran Completely?	
Sampler Enabled (da	•	7/10 16:08	Sampler Enabled (date/time)?	2/10 16:10
Composite Began (da		7/10 16:08	Composite Began (date/time)?	Z/10 16:10
Number of subsample		22/50	Number of subsamples taken?	22/50
Any subsample collec		<i>N</i>	Any subsample collection errors?	
Last Sample (date/tin		7/11 00:23	Last Sample (date/time)?	2/11 00:24
Est. Sample Volume		<u>1.3 gal</u>	Est. Sample Volume Collected (ml)	1.1 901
Sample ID?	Λρ	Q-021102-IN	Sample ID?	12-02402-04T
Y/N	Value	Storm	n Validation Criteria	٦
\ \frac{1}{\sqrt{1}}		T-1	ry period of at least six hours?	-
V 0.		Was total rainfall greater t		┥
7 ~1		Was runoff duration greate	<u> </u>	7
				- Rem 133 - 92
Y/N	Value	Flow-weighted Con	oposite Sample Validation Criteria] New 10.36: 45,
7 ~90	% (approx.)	Was greater than 75% of t	he total volume of the storm sampled?	J - 4000
1 72	# subsample	Were at least 10 sub-samp	les collected at the inlet?	Fro. 9607 19987 905
'V 77	# subsample	Were at least 10 sub-samp	les collected at the outlet?	
			_Field blank collected? If so, Sample ID	·
NOTES (including an	y problems with	equipment or maintenance	activities performed):	

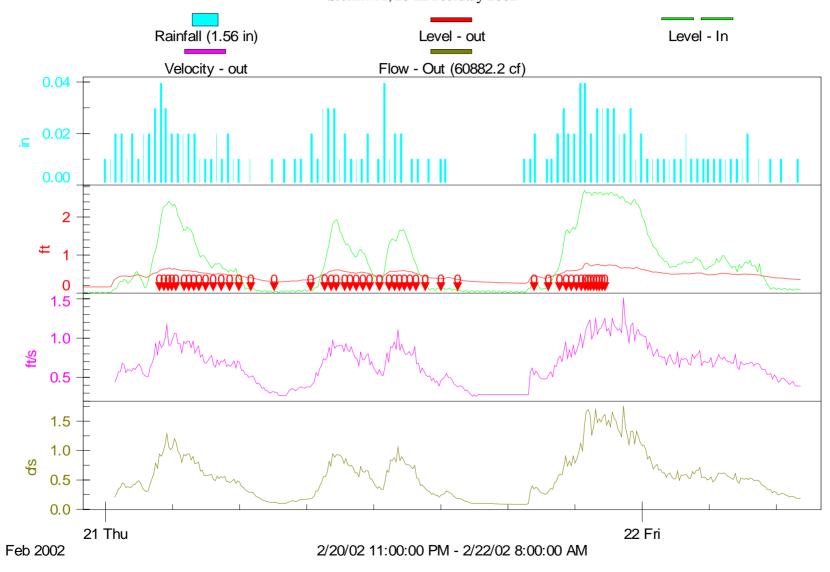
STORM EVENT

NUMBER 11

,				
•				

SR 405 Vortechnics

Storm#11, 20-22 February 2002



,				
•				



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CASE NARRATIVE for B2B0484

Client: Taylor Associates

Project Manager: James Packman Project Name: SR405 Vortechs Project Number: Not Provided

1.0 DESCRIPTION OF CASE

Two water samples were submitted for the analysis of Total and Dissolved Metals by EPA 200.8 and conventional chemistry parameters by APHA/EPA Methods.

2.0 COMMENTS ON SAMPLE RECEIPT

The samples were received and logged in on 22nd February 2002 at a temperature of 8.3 Degrees Celsius.

3.0 Preparation and Analysis

Total and Dissolved Metals by EPA 200.8

All criteria for acceptable QC measurements were met with the following exceptions:

An aliquot of unpreserved sample was filtered and preserved in the lab in accordance with EPA 3005 for the analysis of dissolved metals.

Conventional Chemistry Parameters by APHA/EPA Methods

All criteria for acceptable QC measurements were met with the following exceptions:

- An aliquot of unpreserved sample was preserved with Sulfuric Acid in the lab for the analysis of Phosphorous by EPA 365.5.
- The percent recovery for the Total Suspended Solids in analytical batch 2B22012 was above the established control limits of 30%. Since all other QC recoveries in the batch were within control limits this does not represent an out of control batch.

"I certify that this data package is in compliance with the Contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature."

Project Manager

North Creek Analytical



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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
VDR-022102-IN	B2B0484-01	Water	02/21/02 22:19	02/22/02 08:25
VDR-022102-OUT	B2B0484-02	Water	02/21/02 22:20	02/22/02 08:25

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Taylor Associates Inc 7104 Greenwood Ave N Scattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

Total Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Anaiyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VDR-022102-IN (B2B0484-01) Water	Sampled: 02/	21/02 22:19	Received	1: 02/22/02	08:25				
Zinc	0.0617	0.0100	mg/l	1	2B22034	02/22/02	02/25/02	EPA 200.8	
VDR-022102-OUT (B2B0484-02) Water Sampled: 02/21/02 22:20 Received: 02/22/02 08:25									
Zinc	0.0766	0.0100	mg/l	1	2B22034	02/22/02	02/25/02	EPA 200.8	

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

Dissolved Metals by EPA 200 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VDR-022102-IN (B2B0484-01) Water	Sampled: 02	/21/02 22:19	Received	1: 02/22/02	08:25				•
Zinc	0.0314	0.0100	mg/l	1	2B22019	02/22/02	02/22/02	EPA 200.8	
VDR-022102-OUT (B2B0484-02) Water Sampled: 02/21/02 22:20 Received: 02/22/02 08:25									
Zinc	0.0766	0.0100	mg/l	1	2B22019	02/22/02	02/22/02	EPA 200.8	

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

Conventional Chemistry Parameters by APHA/EPA Methods North Creek Analytical - Bothell

		Reporting							
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VDR-022102-IN (B2B0484-01) Water	Sampled: 02	/21/02 22:19	Received:	02/22/02	08:25				
Hardness	26.5	1.00 mg	g eg. CaCO3/L	1	2B22023	02/22/02	03/01/02	SM 2340B	
Orthophosphate-phosphorus	0.00457	0.00200	mg/l	π-	2B23006	02/23/02	02/23/02	EPA 365.2	
Phosphorus	0.0860	0.00500	*	**	2B25027	02/25/02	02/25/02	•	
рН	6.99		pH Units	"	2B22026	02/22/02	02/22/02	EPA 150.1	
Total Suspended Solids	53	4.0	mg/i	**	2B22012	"	Ħ	EPA 160.2	
Turbidity	36.5	1.00	NTU	R	2B22021	n	n	EPA 180.1	
VDR-022102-OUT (B2B0484-02) Water	Sampled:	02/21/02 22:	20 Received	1: 02/22/0	2 08:25				
Hardness	26.6	1.00 mg	g eq. CaCO3/L	1	2B22023	02/22/02	03/01/02	SM 2340B	
Orthophosphate-phosphorus	0.00271	0.00200	mg/l		2B23006	02/23/02	02/23/02	EPA 365.2	
Phosphorus	0.0942	0.00500	"		2B25027	02/25/02	02/25/02	п	
РН	6.98		pH Units	п	2B22026	02/22/02	02/22/02	EPA 150.1	
Total Suspended Solids	73	4.0	mg/l	n	2B22012	**	pt .	EPA 160.2	
bidity	38.2	1.00	NTU		2B22021	"	n	EPA 180.1	

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

Total Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2B22034: Prepared 02/22/02	Using El	PA 200 Ser	ies		- ·					
Biank (2B22034-BLK1)										
Zine	ND	0.0100	mg/l							
LCS (2B22034-BS1)										
Zinc	0.213	0.0100	mg/l	0.200		106	85-115			
LCS Dup (2B22034-BSD1)										
Zinc	0.210	0.0100	mg/i	0.200		105	85-115	1.42	15	
Duplicate (2B22934-DUP1)					Source: I	32B0409-	01			
Zinc	ND	0.0100	mg/l		ND			7.59	20	
Matrix Spike (2B22034-MS1)					Source: I	32B0409-	01			
Zinc	0.215	0.0100	mg/l	0.200	ND	104	75-125			

North Creek Analytical - Bothell

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

Dissolved Metals by EPA 200 Series Methods - Quality Control North Creek Analytical - Bothell

	• •		Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2B22019:	Prepared 02/22/02	Using E	PA 3005A								
Blank (2B22019-BL	JK1)										
Zinc		ND	0.0100	mg/l	•						
LCS (2B22019-BS1))										
Zinc		0.209	0.0100	mg/l	0.200		104	85-115			
LCS Dup (2B22019	-BSD1)							•			
Zinc		0.205	0.0100	mg/l	0.200		102	85-115	1.93	· 15	
Duplicate (2B22019	-DUP1)					Source: E	32B0484-) 1			
Zinc		0.0320	0.0100	mg/l	••	0.0314			1.89	20	
Matrix Spike (2B22	019-MS1)					Source: B	32B0484-)1			
Zinc		0.232	0.0100	mg/l	0.200	0.0314	100	75-125			

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2B22012:	Prepared 02/22/02	Using G	eneral Pre _l	paration	•					•	
Blank (2B22012-BI	LK1)										
Total Suspended Solid	s	ND	4.0	mg/l						-	200000
Duplicate (2B22012	2-DUP1)					Source: E	32B0417-	01			
Total Suspended Solid	s	96	4.0	mg/l		130			30	19	Q-07
Batch 2B22021:	Prepared 02/22/02	Using G	eneral Pre	paration							
Blank (2B22021-Bl	LKI)										
Turbidity	·	ND	1.00	NTU				•			
LCS (2B22021-BS1)										
Turbidity		18.2	1.00	NTU	20.0		91.0	90-110			
LCS Dup (2B22021	-BSD1)										
ridity		18.5	1.00	NTU	20.0		92.5	90-110	1.63	20	
Duplicate (2B22021	I-DUP1)					Source: I	32B0484-	91			
Turbidity	,	39.0	1.00	NTU	····	36.5			6.62	20	
Batch 2B22023:	Prepared 02/22/02	Using El	PA 200 Ser	ies							
Blank (2B22023-BI	LK1)										
Hardness		ND	1.00mg	g eq. CaCO3/L							
LCS (2B22023-BS1)										
Hardness		61.6	1.00mg	eq. CaCO3/L	66.2		93.1	70-130		••••	

orth Creek Analytical - Bothell

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Amar Gill, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**



Seattle 11720 North Creek Pkwy N. Suite 400. Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210

East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9290 fax 509.924.9290

9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 Portland

541.383.9310 fax 541.382.7588

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

	 		Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2B22023:	Prepared 02/22/02	Using E	PA 200 Ser	ries							
LCS Dup (2B22023	3-BSD1)							•			
Hardness		61.4	1.00m	g eq. CaCO3/L	66.2		92.7	70-130	0.325	20	
Duplicate (2B2202:	3-DUPI)					Source: E	2B0484-	01			
Hardness		26.5	1.00mg	g eq. CaCO3/L		26.5			0.00	20	
Matrix Spike (2B2)	2023-MS1)					Source: E	2B0484-	01			
Hardness	· · · · · · · · · · · · · · · · · · ·	90.6	1.00 mg	g eq. CaCO3/L	66.2	26.5	96.8	75-125			•
Batch 2B22026:	Prepared 02/22/02	Using G	eneral Pre	paration							
Duplicate (2B2202	6-DUP1)					Source: B	2B0484-	91			
рН	· · · · · · · · · · · · · · · · · · ·	7.01		pH Units		6.99			0.286	10	
Batch 2B23006:	Prepared 02/23/02	Using G	eneral Pre	paration							
.nk (2B23006-B)	LK1)						·				
Orthophosphate-phosp	phorus	ND	0.00200	mg/l							
LCS (2B23006-BS)	1)										
Orthophosphate-phosp	phorus	0.148	0.00200	mg/l	0.150		98.7	90-110			
LCS Dup (2B23006	6-BSD1)										
Orthophosphate-phosp	phorus	0.152	0.00200	mg/l	0.150		101	90-110	2.67	20	•
Matrix Spike (2B2:	3006-MS1)					Source: B	2B0484-	01			
Orthophosphate-phosp	phorus	0.0509	0.00200	mg/i	0.0499	0.00457	92.8	80-120			

North Creek Analytical - Bothell

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amar Gill, Project Manager



117/20 North Creek Pkwy N, Spite 400, Bothell, VVA 98011-8244

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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.5310 fax 541.382.758B

Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103 Project: SR405 Vortechs

Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2B23006:	Prepared 02/23/02	Using G	eneral Pre	paration							
Matrix Spike Dup ((2B23006-MSD1)					Source: E	2B0484-	01			
Orthophosphate-phosp	horus	0.0523	0.00200	mg/l	0.0499	0.00457	95.7	80-120	2.71	25	
Batch 2B25027:	Prepared 02/25/02	Using G	eneral Pre	paration							
Blank (2B25027-BI	JK1)										-
Phosphorus		ND	0.00500	mg/l							,
LCS (2B25027-BS1)										
Phosphorus	^-1	0.149	0.00500	mg/i	0.150		99.3	90-120			
LCS Dup (2B25027	'-BSD1)										
Phosphorus		0.146	0.00500	mg/l	0.150		97.3	90-120	2.03	20	
Matrix Spike (2B25	5027-MS1)					Source: E	32B0413-	03			
phorus		0.0378	0.00500	mg/l	0.0250	0.0150	91.2	57-137			
Matrix Spike Dup ((2B25027-MSD1)					Source: E	32B0413-	03			
Phosphorus		0.0389	0.00500	mg/l	0.0250	0.0150	95.6	57-137	2.87	25	

North Creek Analytical - Bothell

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Amar Gill, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**

Page 9 of 10



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Spokane

Portland

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Taylor Associates Inc 7104 Greenwood Ave N Seattle WA/USA, 98103

Project: SR405 Vortechs Project Number: Not Provided Project Manager: James Packman

Reported: 03/04/02 11:33

Notes and Definitions

Q-07 The RPD value for this QC sample is above the established control limit. Review of associated QC indicates the high RPD does not represent an out-of-control condition for the batch.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

Sample results reported on a dry weight basis dry

Relative Percent Difference RPD

North Creek Analytical - Bothell

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Amar Gill, Project Manager

North Creek Analytical, Inc. **Environmental Laboratory Network**

Page 10 of 10

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				CHIA	CHAIN OF CUSTODY RECORD	CU	STC	텕	Z	읽	켐			F	k		_	
ample Collection by: AYLOR ASSOCIATES	Client: WSDOT	ł										I	~	,	-4			
ontact: James Packman el: 206.781.1487	Tel: 206,440,5070	Cammerme).5070	yer							0	Page: Project ID: Case File #:		\[\sum_{-} \])), 2,	(C)	Ver	Jartaluits	, L
aboratory: North Creek Analytical ontact: Amar Gill	alytical	Q.	University of Washington Contact: David Stensel	y of Wa David S	shington Stensel				Ħ	ate re	corde	d by:						
el: 425.420.9232	\		Tel: 206.543.9358	543.935	σσ		\prod]] [Ang	ysis R	Analysis Required] [1	Ш	
																	· · · · · · · · · · · · ·	
SR405 Vortechs Monitoring Project	ortechs	тм Мо	nitori	ng P	rojec						Zn				•			
								dity	ness	Zn	lved Z		-P		? }	7		
Sample ID	Date Collected	Time Collected	Comp? Grab?		# of contain.	matrix	TSS	Turbi	Hardr	Total	Disso	TP	Ortho	PSD	Other	Other		Notes
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amples	3 4 C		Printed Name	amie		AK ZOKONSK	SY	r		Pil	Printed Name	12						
•			Date/Time 2/72/02	2	72/02		08:25	2		Date	Date/Time							
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Particle Size Distribution Analysis Results

Report Prepared for. Ingrid Weltz Taylor Associates Tel: 206.633.4486 Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact: Dr. David Stensel Tel: 206.543.9358

Size Volume Currulative Mass

Project ID:

SR405 Vortechs

Sample ID:

VOR-022102-IN-PSD

Date and Time Collected:

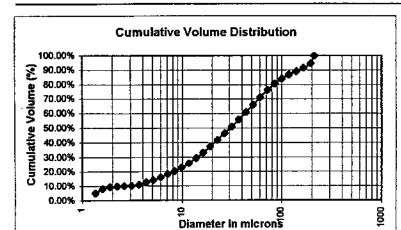
2/21/02

22:14

Date and Time of PSD Analysis:

2/22/02

12:30



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Volume concentration(ul/ml)	8.00	Т			_												
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		0.00-1.36	.50-1.89	2.23-2.63	3.11-3.67	4.33-5.11	6,03-7,11	8,39-9,90	11.69-13.79	16.27-19.20	22.66-26.74	31.56-37.24	43,95-51,88	61.20-72.22	85.22-100.57	118,67-140,04	165.26-195.02
		8	8	ĸ	÷	8	8	ਲ	훭	27-1	8	×	Š	ģ	5-10	÷.	캶
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							D	iam			nicr	ons			ш	Ξ	₽

OKE	Ammin	OCHIMATIVE	9445
Range	Concentration	Volume	
(microns)	(ul / l)	(%)	(mg)
0.00-1.36	6.91	5.08%	4.55
1.36-1.60	3.95	7.97%	2.60
1.60-1.89	1.79	9.29%	1.18
1.89-2.23	0.70	9.80%	0.46
2.23-2.63	0.33	10.04%	0.22
2.63-3.11	0.37	10.32%	0.24
3.11-3.67	0.95	11.01%	0.63
3.67-4.33	1.92	12.42%	1.26
4.33-5.11	2.14	13.99%	1.41
5.11-6.03	2.87	16.10%	1.89
6.03-7.11	2.90	18.23%	1.91
7.11-8.39	2.87	20.34%	1,89
8.39-9.90	3.36	22.80%	2.21
9.90-11.69	4.00	25.74%	2.64
11.69-13.79	4.86	29.30%	3.20
13.79-16.27	5.12	33.06%	3.37
16.27-19.20	5.71	37.25%	3.76
19.20-22.66	6.09	41.72%	4.01
22.66-26.74	6.28	46.32%	4.13
26.74-31.56	6.35	50.98%	4.18
31.56-37.24	6.51	55.76%	4.29
37.24-43.95	7.05	60.94%	4.64
43.95-51.86	7.13	66.17%	4.69
51.86-61.20	6,91	71.24%	4.55
61.20-72.22	6.81	76.24%	4.49
72.22-85.22	6.06	80.69%	3.99
85.22-100.57	4.75	84.18%	3.13
100.57-118.67	3.69	86.89%	2.43
118.67-140.04	2.97	89.07%	1.96
140.04-165.26	3.20	91.42%	2.11
165.26-195.02	4.25	94.53%	2.80
195.02-212	7.45	100.00%	4.90
Total	136.23	· · ·	89.70

Computed Statistics:

Weight Mean = 56.59 microns

 $D_{10} = 2.23$ microns $D_{50} = 26.74$ microns $D_{90} = 140.04$ microns

Volume of Sample:

1000 ml

Volume of Dilution:

1000 ml added

Comments:

1/0/00

Size Range	Mass of TSS	% Mass
(#HGF008) < 212	89.70	92.57%
212-425	5.00	5.16%
425-850	1.80	1.86%
>850	0,40	0.41%
Total	96.90	100.00%

Particle Size Distribution Analysis Results

22:20

15:45

Report Prepared for: ingrid Weltz Taylor Associates Tel: 206.633.4486 Analysis Performed by: Lynel Rabago University of Washington Department of Civil Engineering Contact: Dr. David Stensel Tel: 206.543,9358

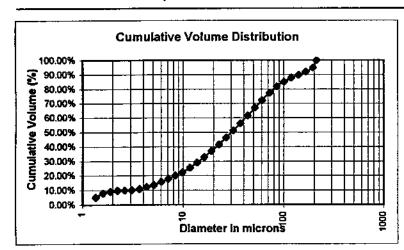
Project ID:

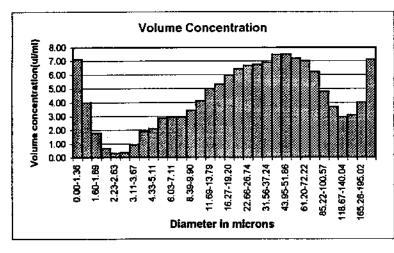
SR405 Vortechs

Sample ID:

VOR-022102-OUT-PSD

Date and Time Collected: Date and Time of PSD Analysis: 2/21/02 2/22/02





SIZE	volume	CUmulative	Mass
Range	Concentration	Volume	
(microns)	(ul/ŋ ""	(%)	(mg)
0.00-1.36	7.15	5.12%	4.02
1.36-1.60	3.99	7.99%	2.24
1.60-1.89	1.76	9.25%	0.99
1.89-2.23	0.67	9.73%	0.37
2.23-2.63	0.31	9.95%	0.18
2,63-3.11	0.35	10.21%	0.20
3.11-3.67	0.93	10.87%	0.52
3.67-4.33	1.89	12.23%	1.06
4.33-5.11	2.09	13.73%	1.18
5.11-6,03	2.86	15.77%	1.61
6.03-7.11	2.93	17.87%	1.65
7.11-8.39	2.93	19.98%	1.65
8.39-9.90	3.41	22.42%	1.91
9,90-11,69	4.10	25.36%	2.30
11.69-13.79	5.01	28.95%	2.82
13.79-16.27	5.30	32.75%	2.98
16.27-19.20	5.95	37.01%	3.34
19.20-22.66	6.43	41.62%	3.61
22.66-26.74	6,68	46.42%	3.76
26.74-31.56	6.74	51.25%	3.79
31.56-37,24	6.90	56.19%	3.88
37.24-43.95	7.49	61.56%	4.21
43.95-51.86	7.51	66.95%	4.22
51.86-61.20	7.21	72.12%	4.05
61.20-72.22	7.02	77.15%	3.95
72.22-85.22	6.20	81.59%	3.48
85.22-100.57	4.79	85.03%	2.69
100.57-118,67	3.69	87.68%	2.08
118.67-140.04	2.95	89.79%	1.66
140.04-165.26	3.09	92.01%	1.74
165.26-195.02	4.02	94.89%	2.26
195.02-212	7.12	100.00%	4.00
Total	139.45		78.40

Computed Statistics:

Weight Mean = 55.32 microns

 $D_{10} = 2.63 \text{ microns}$ $D_{50} = 26.74 \text{ microns}$ $D_{90} = 140.04 \text{ microns}$

Volume of Dilution:

1000 ml

Volume of Dilution: 800 ml added

Comments: 1/0/00

Size Range (microne)	Mass of TSS (mg)	% Mass T85
< 212	78.40	98.74%
212-425	0.80	1.01%
425-850	0.10	0.13%
>850	0.10	0.13%
Total	79.40	100.00%

SITE VISIT SHEET (SR 405 Vortechs **M Monitoring) Date/Time Z/20/42 12:30 Field Staff TP Weather Pre-Strom Visit - or - Post-Storm Visit (circle one) **INLET QUTLET** Check Current Readings / Download: Check Current Readings / Download: ISCO Time? reset (Y/N)? ISCO Time? reset (Y/N)? Time downloaded Level (ft.) level (ft.) り・りてろ Velocity (f/s) Flow (cfs) Total Flow (cf) Sig/Spec str. Time downloaded Pre - Storm Visit **INLET** OUTLET 12.39 Battery (V) Battery (V) Clean bottle (Y/N)? Clean bottle (Y/N)? Pump tubing ok (Y/N)? Replaced? Pump tubing ok (Y/N)? Replaced? Sampler tubing ok (Y/N)? Sampler tubing ok (Y/N)? Strainer ok? Strainer ok? Ext. desiccant ok (Y/N)? Changed? Ext. desiccant ok (Y/N)? Changed? Int. desiccant ok (Y/N)? Changed? Int. desiccant ok (Y/N)? Changed? Measure Dn level? Ok? Measure Dn level? Ok? 200ml Sample Volume (ml) Enable level (ft) >0.55 Inspect Rain Gage Pacing (cf) / Sample Volume (ml) Sampler enabled? (Y/N) Sampler enabled? (Y/N) offset 0.14 no delay to stant Post - Storm Visit INLET **OUTLET** Equipment Ran Completely? Equipment Ran Completely? Sampler Enabled (date/time)? Sampler Enabled (date/time)? Composite Began (date/time)? Composite Began (date/time)? Number of subsamples taken? Number of subsamples taken? Any subsample collection errors? Any subsample collection errors? Last Sample (date/time)? Last Sample (date/time)? Est. Sample Volume Collected (ml) Est. Sample Volume Collected (ml) Sample ID? Sample ID?

Y/N	Value	Storm Validation Criteria
	hrs. (if known)	Was there an antecedent dry period of at least six hours?
	in.	Was total rainfall greater than or equal to 0.25"?
	hrs.	Was runoff duration greater than one hour?

Y/N	Value	Flow-weighted Composite Sample Validation Criteria
	% (approx/)	Was greater than 75% of the total volume of the storm sampled?
·		Were at least 10 sub-samples collected at the inlet?
	# subsample	Were at least 10 sub-samples collected at the outlet?

Was a field duplicate collected? If so, Sample ID.	Field blank collected? If so, Sample ID.	
· · · · · · · · · · · · · · · · · · ·	11000 01000 0100 12 30, 01011 pto 12.	

NOTES (including any problems with equipment or maintenance activities performed):

Golden V. Zamerskiller

SITE VISIT SHEET (SR 405 Vortechs **M Monitoring)

Date/Time 2/72/02 7:00	Field Staff TA	Weather 12/14 Your	_				
Pre-Str	om Visit - or - Post-Storm	Vişit (circle one)					
INLET		OUTLET					
Check Current Readings / Download ISCO Time? reset (Y/N)? Time downloaded level (ft.) INLET Battery (V) Clean bottle (Y/N)? Pump tubing ok (Y/N)? Replaced? Sampler tubing ok (Y/N)? Strainer ok? Ext. desiccant ok (Y/N)? Changed? Int. desiccant ok (Y/N)? Changed? Measure Dn level? Ok? Sample Volume (ml)	d:	0,358 0,40 0,150 5,2413 1/3 05:14					
Inspect Rain Gage							
Sampler enabled? (Y/N)		Pacing (cf) / Sample Volume (ml) Sampler enabled? (Y/N)					
	Doct Stown V	7î.ni.					
INLET	Post - Storm V	OUTLET					
	Y 1/21/20123 2/21 ()Z:23	Equipment Ran Completely? Sampler Enabled (date/time)? Composite Began (date/time)?	Z1>1 02:25 Z42! 02:25				
Number of subsamples taken?	50/50	Number of subsamples taken?	30/50				
Any subsample collection errors?	~0	Any subsample collection errors?					
	2/21 22:19	Last Sample (date/time)?	05:55 15/5				
Est. Sample Volume Collected (ml)	10,5L	Est. Sample Volume Collected (ml)	91				
Sample ID?	NT-201520-74	Sample ID?	10 -655105- Or.				
Y/N Value		Validation Criteria]				
		y period of at least six hours?]				
		greater than or equal to 0.25"?					
$Y \sim 30$ hrs.	Was runoff duration greater	than one hour?]				
Y/N Value	Flow-weighted Com	posite Sample Validation Criteria	40996- 1600685				
	409 % (approx.) Was greater than 75% of the total values of the day						
✓ ✓/50 # subsample	Were at least 10 sub-sample	les collected at the inlet?					
y 76/30 # subsample	Were at least 10 sub-sample	es collected at the outlet?	1241.56 = 7c				
		Field blank collected? If so, Sample ID.					
NOTES (including any problems with	equipment or maintenance	activities performed):					

APPENDIX B - Maintenance Inspection Field Log

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•		



Vortechs™ Stormwater Treatment System

Inspection & Maintenance Log

Model: 11000 Location: SR 405

		Grit	Chamber	Upstrea	m Chamber	Flow	Control	Downstre	am Chamber		
Date	Personnel	Sediment depth (in.)	Sheen and floatables	Sediment depth (in.)	Sheen and floatables	Sediment depth (in.)	Sheen and floatables	Sediment depth (in.)	Sheen and floatables	Maintenance	Comments
3/23/2000	IW	44.0	see comments	24.0	see comments	manhole sealed	manhole sealed			Notified WSDOT that maintnenance is required.	Water not visible in grit chamber. U/s chamber filled.
4/18/2000	WSDOT									Maintenance performed.	U/s and grit chambers cleaned.
4/20/2000	IW					manhole sealed	 manhole sealed			performed	Visually inspected grit chamber and u/s manhole. Sediment had been removed.
4/28/2000	IW	0.0	many float.		none	 manhole sealed	 manhole sealed				80% of grit chamber surface covered with cigs/straw.
5/2/2000	IW	1.0				 manhole sealed	manhole sealed				
5/16/2000	IW	1.0	few float.		few float.	 manhole sealed	 manhole sealed				Sediment accumulating in u/s manhole.
5/23/2000	IW	1.0		4.0		 manhole sealed	 manhole sealed				A large pile of sediment under the inlet pipe and large gravel in pipe.
6/2/2000	IW	1.0		4.0		 manhole sealed	 manhole sealed	<1	few float.		Sediment piled almost to inlet pipe invert.
6/22/2000	IW	2.0	few float.		few float.	 manhole sealed	 manhole sealed				Sediment piled to inlet pipe invert.
7/7/2000	IW	2.0	few float.	2.0	cig/trash/sed**	 manhole sealed	 manhole sealed	<1	few float.		Sediment piled to inlet pipe invert.
7/20/2000	IW	1.0	slight sheen	2.0	slight sheen	 manhole sealed	manhole sealed	2.0	slight sheen		Sediment piled to inlet pipe invert.
8/9/2000	IW	2.0	<5 % straw	2.0	slight sheen, <5% float	 manhole sealed	 manhole sealed	5.0	none		Sediment piled to inlet pipe invert.
9/12/2000	IW	2.0	sheen, 10% cigs, grass	2.0	water is clear, not float	manhole sealed	 manhole sealed	1.0	slight sheen		Sediment piled to inlet pipe invert. Some sediment in inlet pipe.
10/6/2000	IW	2.0	no sheen	2.0	water is clear, not float	 manhole sealed	 manhole sealed	1.0	none		Sediment in inlet pipe
11/27/2000	IW	2.0	slight sheen, slight coverage of grass, pine needles, cig butts	3.0	water is clear, not float	 manhole sealed	manhole sealed	1.0	none		Sediment in inlet pipe, 16" across inlet pipe of about 1 diameter.
12/19/2000	IW	6.0	slight sheen, approx. 80% (3/4 pine needles, 1/4 cig butts)	10.0	no sheen, water clear, no float.	manhole sealed	 manhole sealed	2.0	no sheen or float. Water cloudy		Sediment in inlet pipe, 20" across inlet pipe of about 1 diameter. About 1' below outlet invert.
1/29/2001	IW	3.0	slight sheen, some pine needles and cig buts floating	12.0	no sheen, water cloudy	 manhole sealed	 manhole sealed	2.0	no sheen, water slightly cloudy		Light rain at time of inspection. Some visible movement in grit chamber. Sediment in inlet pipe, 20" across inlet pipe. About 1' below outlet invert.
2/28/2001	IW	9.0	slight sheen	13.0	water clear	manhole sealed	manhole sealed	5.2		U/s sample intake needs to be cleaned.	Sediment in inlet pipe, 20" across inlet pipe. Approximately 2' diameter of pile above water level.
3/21/2001	IW/DS	6.5	sheen across surface, 10% float. Grass and cig.	12.5	water clear, slight trickle of flow	manhole sealed	manhole sealed	2.7	water disturbed by maint. activities	U/s & D/s sample intakes cleaned.	U/s chamber almost full w large sand and rocks. About 1' below outlet invert.
4/16/2001	IW/DS	7.5	Sheen. 60% float. (cig and pine needles)	16.5	no sheen, 5% float. (pine needles)	manhole sealed	 manhole sealed	2.7	slight sheen	Repositioned u/s intake line (1-2' above inlet) and removed strainer	U/s chamber almost full. Only about 2" from invert of outlet pipe.
5/3/2001	IW/JP	8.5	Slight sheen. 80% float. (mostly needles & cigs, some styrofoam).	18	no sheen, water clear	manhole sealed	manhole sealed	2.8	water cloudy	Removed d/s strainer (still about 1-2 off pipe invert	Chamber almost full. Only about 2" from outlet pipe invert.

Grit Chamber		Upstream Chamber		Flow	Flow Control		Downstream Chamber				
Date	Personnel	Sediment depth (in.)	Sheen and floatables	Sediment depth (in.)	Sheen and floatables	Sediment depth (in.)	Sheen and floatables	Sediment depth (in.)	Sheen and floatables	Maintenance	Comments
6/29/2001	IW/JP	7.5	Slight sheen. 50%. float.: cig and sticks, some styrofoam	20.5	no sheen, water clear	 manhole sealed	 manhole sealed	5.3	slight sheen, water cloudy	Fine sediment likely covering d/s sensor may need to clean if not flushed during storm.	A sediment bridge exists bewtween inlet and outlet. Chamber is full.
10/11/2001	JP	20.4	Sheen 50%, float.: cigarettes, twigs, paper	20.8	no sheen, water clear	manhole sealed	manhole sealed	6.5	no sheen, water turbid		Was raining during visit. Flow seemed to be going unidirectional in grit chamber and not swirling.
12/20/2001	JP	24.5	Slight sheen. Twigs, leaves, bubbles present	19.7	no sheen, no float.	 manhole sealed	 manhole sealed	7.0	no sheen, no float.		D/s chamber very turbid.
2/8/2002	JP	24.4	Slight sheen. Twigs, leaves, bubbles present	22.2	sheen present, but no float.	not measured, manhole sealed	not measured, manhole sealed	7.2	no sheen, no float.		